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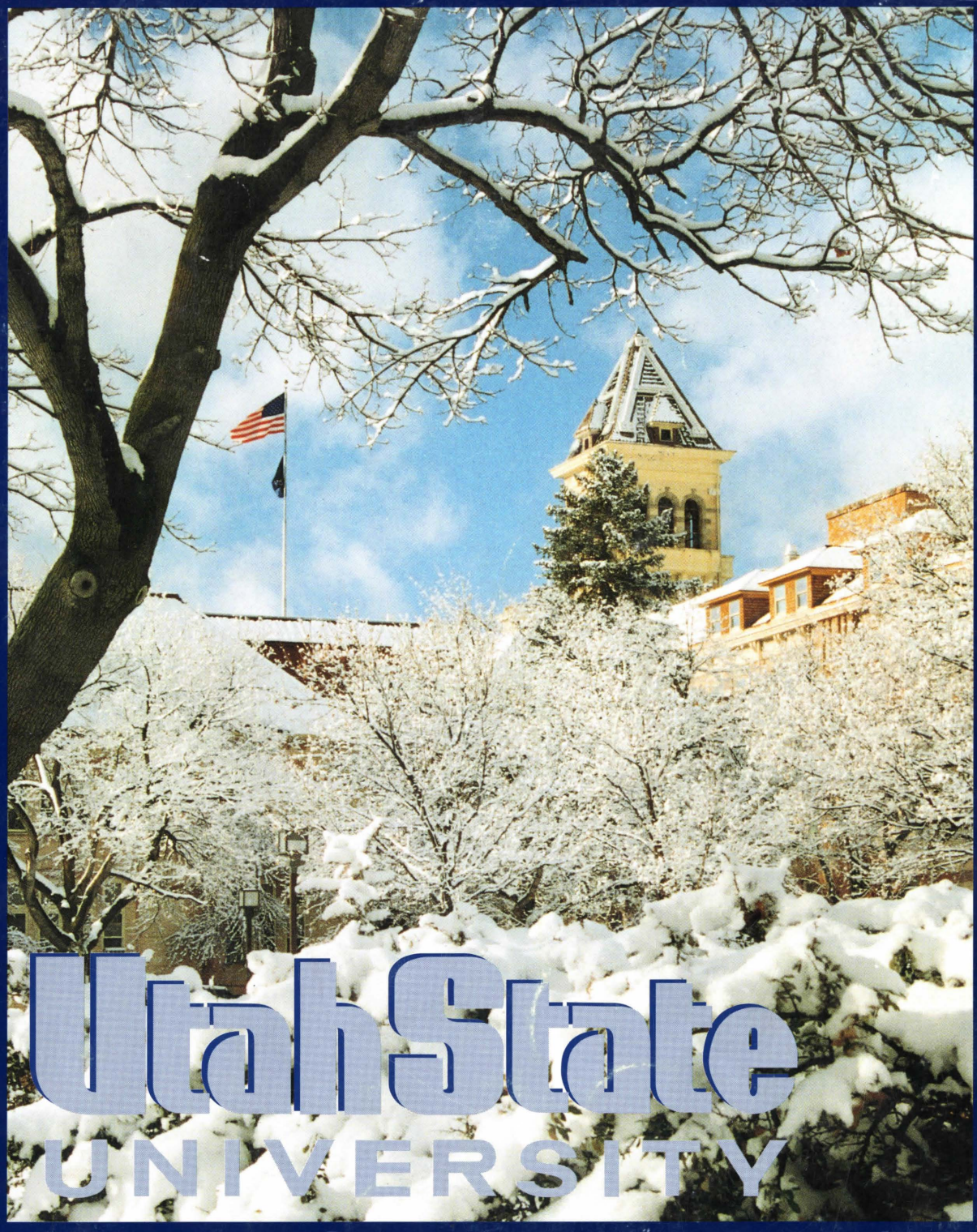

Utah State UNIVERSITY

UNDERGRADUATE CATALOG 1996-1998

Utah State University Bulletin

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c. 2

1996-1998

Undergraduate Catalog

Office of High School/College Relations
University Inn 101
Utah State University
Logan, Utah 84322-0160

Telephone (801) 797-1129
Facsimile (801) 797-2644
Web Home Page http://www.usu.edu

Catalog Information

Catalog information and University requirements may change at any time. USU is not bound by requirements or regulations listed in this catalog. Information may change before a new catalog is issued, and students must adhere to changes. It is the student's obligation to ascertain current rules, regulations, fees, and requirements.

Course Descriptions

Course descriptions in this catalog are an overview and generally reflect what will be taught, but students should not rely on them as a guarantee of what they will be taught in a given quarter.

Assumption of Risk

Some classes, programs, and extracurricular activities within the University involve some risk and some may also involve travel. The University provides these programs on a voluntary basis, and students ought not participate in them if they do not care to assume the risks. Students ought to inquire as to possible risks a program may generate, and if they are not willing to assume the risks, they should not select that program. By voluntarily participating in these types of classes, programs, and extracurricular activities the student agrees not to hold USU or its staff liable.

Equal Opportunity/Affirmative Action

Utah State University is committed to providing equal educational and employment opportunity regardless of race, sex, color, religion, national origin, marital or parental status, physical or mental disability, veteran status, or age. USU also has a policy prohibiting sexual harassment of students, faculty, and staff. Equal opportunity applies to all aspects of employment: recruiting, hiring, promoting, training, benefits, and salary. Equal educational opportunities include admission, access to course offerings, financial assistance, housing, and extracurricular activities.

Privacy Rights

In compliance with the Family Educational Rights and Privacy Act of 1974, Utah State University has developed policy guidelines which (1) provide that eligible students will have access to inspect and review their educational records, and (2) protect the rights of a student to privacy by limiting access to the educational record without express written consent. **Note:** There are restricted situations in this act where access to an educational record **does not** require the express written consent of the student.

Materials for Persons with Disabilities

This catalog is available in large print, audio, and braille format upon request to the USU Disability Resource Center.

UTAH STATE UNIVERSITY BULLETIN

USPS 6542-6000

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Calendar

1996-97

1996 Fall Quarter

Sept. 30, Oct. 1	New student orientation
October 2	Classes begin
November 27,28,29	Thanksgiving break
December 9,10,11,12,13	No-test days
December 13	Last day of classes
December 16,17,18,19	Final examinations

1997 Winter Quarter

January 6	Classes begin
January 20	Holiday (Human Rights Day)
March 10,11,12,13,14	No-test days
March 14	Last day of classes
March 17,18,19	Final examinations

1997 Spring Quarter

March 25	Classes begin
May 26	Holiday (Memorial Day)
May 27,28,29,30, June 2	No-test days
June 2	Last day of classes
June 3,4,5,6	Final examinations
June 6,7	Graduation

1997 Summer Quarter

June 9-13	Presession
June 16-20	Presession
June 23	Classes begin
July 4	Holiday (Independence Day)
July 24	Holiday (Pioneer Day)
August 15	Quarter ends
August 18-22	Postsession

1997-98

1997 Fall Quarter

September 29,30	New student orientation
October 1	Classes begin
November 26,27,28	Thanksgiving break
December 8,9,10,11,12	No-test days
December 12	Last day of classes
December 15,16,17,18	Final examinations

1998 Winter Quarter

January 5	Classes begin
January 19	Holiday (Human Rights Day)
March 9,10,11,12,13	No-test days
March 13	Last day of classes
March 16,17,18	Final examinations

1998 Spring Quarter

March 24	Classes begin
May 25	Holiday (Memorial Day)
May 26,27,28,29, June 1	No-test days
June 1	Last day of classes
June 2,3,4,5	Final examinations
June 5,6	Graduation

1998 Summer Quarter

June 8-12	Presession
June 15-19	Presession
June 22	Classes begin
July 3	Holiday (Independence Day)
July 24	Holiday (Pioneer Day)
August 14	Quarter ends
August 17-21	Postsession

Utah State University

The academic advantages of a large university together with the friendliness of a small college are offered at Utah State University. With a student body of about 20,000, USU recognizes that the needs of the individual are of major importance, and many programs have been established to give the student the optimum of individual attention.

With 45 departments in eight academic colleges, a School of Graduate Studies, University Extension, and several research programs, Utah State University offers an excellent opportunity for students to study a wide range of subjects.

USU was founded in 1888 as part of the public educational system of Utah and operates under the constitution and laws of the state. It belongs to the family of institutions known as land-grant universities, which had their origin in 1862. The institution was originally called the Agricultural College of Utah, later becoming Utah State Agricultural College. The state legislature designated the name change to Utah State University in 1957.

A sixteen-member State Board of Regents governs the Utah state system of higher education. This board has the responsibility for state-wide master planning for higher education, assignment of roles to the several institutions in the state system, and control of operating and capital budgets for the institutions. USU has a ten-member Board of Trustees which is responsible for implementing the assigned roles, including the appointment of personnel and the enactment of rules and governing regulations.

USU is governed by the State Board of Regents and accredited by Northwest Association of Schools and Colleges, National Council for Accreditation of Teacher Education, American Psychological Association, American Association of Family and Consumer Sciences, the American Assembly of Collegiate Schools of Business, Utah State Board of Education—Teacher Education Program, Council on Rehabilitation Education, Accrediting Board of Engineering and Technology, American Society of Landscape Architects, Commission on Accreditation—Council on Social Work Education, American Chemical Society, Society of American Foresters, National League for Nursing, American Boards of Examiners in Speech Pathology and Audiology, American Dietetic Association, Foundation for Interior Design, Education, and Research, National Association of Schools of Music, Utah State Board of Vocational Education, and the Society for Range Management. USU is a land-grant and a Carnegie Foundation "Research University I" institution. Credit earned at USU is fully transferable to other universities and colleges in the United States of America.

Utah State University Mission Statement

Utah State University integrates teaching, research, extension, and service to meet its unique role as Utah's land-grant university. Students are the focus of the University as they seek intellectual, personal, and cultural development.

The mission of Utah State University is to provide high quality undergraduate and graduate instruction, excellent general education, and specialized academic and professional degree programs. USU is committed to preparing students to serve the people of Utah, the nation, and the world.

USU provides nationally and internationally acclaimed programs of basic and applied research. USU engages in research to further the quest for knowledge and to help society meet its scientific, technological, environmental, economic, and social challenges.

Outreach to Utah's citizens through extension and service programs is central to the University's mission. The University's outreach programs provide to individuals, communities, institutions, and industries throughout the state, services that help improve technology, the environment, and quality of life.

In all its endeavors, the University is committed to developing responsible citizens through freedom of inquiry and expression, and through its best efforts in teaching, research, creative arts, extension and service, and encouraging cultural diversity.

Degrees Offered at Utah State University

College of Agriculture

Agricultural Systems Technology and Education
- Agricultural Education—BS, BA
- Agricultural Systems Technology—BS, BA, MS, MA
- Agricultural Machinery Technology—One-year Certificate, AAS

Animal, Dairy and Veterinary Sciences
- Animal Science—BS, BA, MS, MA, PhD
- Dairy Science—BS, BA, MS, MA
- Bioveterinary Science—BS, BA, MS, MA
- VoTech Dairy Herdsman—One-year Certificate
- Swine Management—One-year Certificate

Economics
- Agricultural Economics—BS, BA, MS, MA
- Agribusiness—BS, BA
- Community Economic Development—MCED
- Economics—BS, BA, MS, MA, PhD

Nutrition and Food Sciences
- Nutrition and Food Sciences—BS, BA, MS, MA, PhD

Plants, Soils, and Biometeorology
- Environmental Soil/Water Science—BS, BA
- Crop Science—BS, BA
- Horticulture—BS, BA
- Plant Science—MS, MA, PhD
- Soil Science—MS, MA, PhD
- Biometeorology—MS, MA, PhD
- Ecology (Plant or Physical)—MS, PhD
- Ornamental Horticulture—One-year Certificate, AAS

Interdepartmental Programs
- Toxicology—MS, PhD
- International Agriculture—BS, BA

College of Business

Accountancy, School of
- Accounting—BS, BA, MAcc

Business Administration
- Business Administration—BS, BA
- Finance—BS, BA
- Marketing—BS, BA
- Production Management—BS, BA

Business Information Systems and Education
- Business Education—BS, BA
- Business Information Systems—BS, BA
- Business Information Systems and Education—MS
- Office Systems Support—AAS
- Marketing Education—BS, BA
- Education—EdD*, PhD*

Economics
- Community Economic Development—MCED
- Economics—BS, BA, MS, MA, PhD
- Social Sciences—MSS*

Management and Human Resources
- Human Resource Management—BS, BA
- Management—BS, BA
- Social Sciences—MSS*

College of Business Programs
- Business—BS, BA
  (Dual major and 2nd BS only)
- Master of Business Administration—MBA

College of Education

Communicative Disorders and Deaf Education
- Communicative Disorders—BS, BA, MS, MA, MEd, EdS
- Education—EdD*, PhD*

Elementary Education
- Elementary Education—BS, BA, MS, MA, MEd
- Early Childhood Education—BS, BA
- Education—EdD*, PhD*

Health, Physical Education and Recreation
- Health Education Specialist—BS
- Physical Education—BS
- Health, Physical Education and Recreation—MS, MEd
- Dance—BS
- Parks and Recreation—BS

Instructional Technology
- Instructional Technology—MEd, MS, EdS
- Education—EdD*, PhD*

Psychology
- Psychology—BS, BA, MS, MA, PhD

Secondary Education
- Secondary Education—BS, BA, MS, MA, MEd
- Education—EdD*, PhD*

Special Education and Rehabilitation
- Special Education—BS, BA, MS, MEd, EdS, PhD
- Education—EdD*, PhD*

Interdepartmental Doctorate in Education
- Doctorate of Education—EdD*, PhD*

College of Engineering

Biological and Irrigation Engineering
- Biological and Agricultural Engineering—BS, MS, PhD
- Irrigation Engineering—MS, PhD

Civil and Environmental Engineering
- Civil and Environmental Engineering—CE, MS, ME, PhD
- Civil Engineering—BS
- Environmental Engineering—BS

Electrical and Computer Engineering
- Computer Engineering—BS
- Electrical Engineering—BS, MS, ME, MES, EE, PhD

Industrial Technology and Education
- Industrial Teacher Education—BS
- Industrial Technology—MS
- Drafting—AAS
- Aeronautics—AAS
- Industrial Technology (Flight)—BS

Industrial Technology (Engineering Technology)—BS
Industrial Technology (Electronics/Computer)—BS
Industrial Technology (AeroTechnology)—BS
Industrial Technology (Welding Engineering Technology)—BS

Mechanical and Aerospace Engineering
Mechanical Engineering—BS, MS, ME, PhD
Aerospace Engineering—BS

College of Family Life

Family and Human Development
Family and Human Development—BS, BA, MS
Early Childhood Education—BS, BA

General Family Life
General Family Life—BS, BA

Human Environments
Apparel Merchandising—BS, BA
Family and Consumer Sciences Education—BS, BA
Interior Design—BS, BA
Human Environments—MS

Nutrition and Food Sciences
Nutrition and Food Sciences—BS, BA, MS, MA, PhD

Interdepartmental Program
Family Life—PhD*

College of Humanities, Arts and Social Sciences

Art
Art—BA, BS, BFA, MA, MFA

Communication
Journalism—BS, BA
Communication—MS, MA

English
English—BS, BA, MS, MA
American Studies—BS, BA, MS, MA

History
History—BS, BA, MS, MA
Social Sciences—MSS*

Landscape Architecture and Environmental Planning
Landscape Architecture—BLA, MLA
Town and Regional Planning—MS

Languages and Philosophy
French—BA
German—BA
Spanish—BA
Philosophy—BS, BA
Speech—BS, BA

Music
Music—BA, BM
Music Therapy—BS, BA

Political Science
Political Science—BS, BA, MS, MA
Prelaw—BS, BA

Sociology, Social Work and Anthropology
Sociology—BS, BA, MS, MA, PhD
Social Sciences—MSS*
Social Work—BS, BA
Anthropology—BS, BA

Theatre Arts
Theatre Arts—BA, BFA, MA, MFA

Interdisciplinary HASS and Science Programs
Liberal Arts and Sciences—BA
Asian Studies—BS, BA

College of Natural Resources

Fisheries and Wildlife
Fisheries and Wildlife—BS, MS, PhD
Ecology (Aquatic)—MS, PhD
Ecology (Fisheries and Wildlife)—MS, PhD

Forest Resources
Forestry—BS, MS, MF, PhD
Forest Management—MF
Ecology (Forest)—MS, PhD
Recreation Resource Management—BS, MS, PhD

Geography and Earth Resources
Geography—BS, BA, MS, MA

Rangeland Resources
Range Science—BS, MS, PhD
Ecology (Range)—MS, PhD

Interdisciplinary Natural Resources Programs
Watershed Science—BS, MS, PhD
Environmental Studies—BS

College of Science

Biology
Applied Biology—BS
Public Health—BS
Biology—BS, BA, MS, PhD
Ecology (Biology)—MS, PhD
Composite Teaching—Biological Science—BS, BA

Chemistry and Biochemistry
Chemistry—BS, BA, MS, PhD
Biochemistry—MS, PhD
Composite Teaching—Physical Science (Chem)—BS, BA
Chemistry Teaching—BS, BA

Computer Science
Computer Science—BS, BA, MS

Geology
Geology—BS, BA, MS
Ecology (Geology)—MS
Composite Teaching—Earth Science—BS, BA

Mathematics and Statistics
Mathematics—BS, BA, MS, MMath
Mathematics Education—BS
Mathematical Sciences—PhD
Statistics—BS, BA, MS
Composite Teaching—Math/CS/Stat—BS, BA

Physics
Physics—BS, BA, MS, PhD
Composite Teaching—Physical Science (Physics)—BS, BA
Physics Teaching—BS, BA

Interdepartmental Program
Toxicology—MS, PhD

Interdisciplinary HASS and Science Program
Liberal Arts and Sciences—BA

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*Interdepartmental degree

Entering Utah State University

Enrollment Services

Assistant Vice President for Student Services: Lynn J. Poulsen
Registrar: Charles L. Olson
Associate Registrar: Elizabeth W. Allen
Assistant Registrar: Stanley A. Bodily
Admissions Counselor: Rhea H. Wallentine

Offices in Taggart Student Center 246

The Office of Enrollment Services performs the following academic services:

1. Admission of Students: interviews prospective students, evaluates credentials; processes applications.

2. Registration: conducts registration and facilitates drop/add, audit, and pass/fail adjustments. See University *Schedule of Classes* for registration procedures.

3. Records: maintains academic records, processes transcripts and all grade adjustments, facilitates advisers, major and name changes, and issues verifications.

4. Scheduling: builds and publishes University *Schedule of Classes*, assigns courses to classrooms, maintains curriculum file of approved courses.

5. Microfilm and ID: maintains microfilm records; issues student and faculty/staff ID cards.

6. Undergraduate Graduation: processes applications, verifies completion of University requirements, orders and distributes diplomas, posts degrees to transcripts, maintains graduation records.

7. Residency: counsels students on Utah residency laws, processes and evaluates residency applications, advises applicants of their status.

8. Veterans Affairs: certifies, reports, and advises U.S. veterans and qualified dependents relative to training and educational benefits.

Admission Requirements

The Utah State University admission policy is designed to admit students who have the best chance to successfully complete a university program of study.

All freshmen, including transfer students with less than 45 quarter hours of credit, must present results of the ACT as part of their application for admission.

Application for admission and credentials from schools previously attended should be received by the Admissions Office by July 1 for fall quarter admission, by November 1 for winter quarter admission, and by February 1 for spring quarter admission.

A student is admitted to the University on the basis of an official application (which includes transcripts of credit from each school previously attended), a $35 nonrefundable application fee, and ACT scores when applicable.

USU grants admission without regard to race, color, creed, sex, or national origin, to students who satisfy the admission requirements.

Freshman Admission

Students attending the University for the first time are admitted on the basis of an index score, which is a reflection of high school grades and ACT or SAT scores. Entering students must have an acceptable index score in order to be admitted. (See Admission Index table on page 9.) Those students with an index score of 100 or higher will be admitted. Students having an index score of 90-99 are very likely to be admitted. On a space available basis, students with an index score between 85 and 89 may be admitted. Those students with an index score below 85 will be denied admission, but will, upon student request, be granted a chance to appeal. Exceptions to the preceding regulations will be made for applicants who have not graduated from high school, who may substitute results of the GED. In cases where the applicant is younger than 25 years, official ACT results are also required. Admission decisions will be made on an individual basis.

High School Curriculum

Students who graduated from high school after 1991 and who desire to attend Utah State University must have completed a preparatory course of study, including the following:

English. Four years (units), emphasizing composition/literature.

Mathematics. Three years (units), selected from elementary algebra, geometry, intermediate algebra, trigonometry, college or advanced algebra, or calculus. It is strongly recommended that students take mathematics up to at least trigonometry.

Biological/Physical Science. Three years (units), selected from biology, chemistry, and physics, including one laboratory experience.

American History. One year (unit).

Additional Courses. Four years (units), chosen from at least two of the following: history, English, mathematics beyond intermediate algebra, laboratory science, foreign language, social science, and fine arts.

Foreign Language. Two years (units) recommended, which must be of the same foreign language.

Students having less than the required number of units, but who have an admission index of 95 or higher, will be admitted on the condition that the deficiency is satisfied within the first 45 quarter hours of study at the University.

When the admission decision is made, an official letter of notification will be sent to the student.

Testing. All freshmen, including transfer students with less than 45 quarter hours of credit, must present the results of the American College Test (ACT) as part of their application for admission to the University. **The test scores must be sent directly to the University from The American College Test, P.O. Box 451, Iowa City, Iowa 52240. (Tel. 1-800-553-6244)**

Early Admission. A high school student who has completed his or her junior year and maintained a superior scholastic record may be granted special consideration for admission. An applicant must satisfy the following requirements:

1. Submit an official application, ACT scores, and a high school transcript.

2. Submit letters of approval and recommendation from:
   (a) Superintendent or principal
   (b) Parent or guardian

3. Admission is not automatic, and will be determined by the admissions committee.

4. Applications for admission and credentials from the high school must be received by the University according to the deadline dates listed under General Admissions Policies.

Nontraditional Admission. An applicant who is not a high school graduate may be considered for admission by presenting satisfactory evidence of ability to do university work. This evidence may be demonstrated by scores on the General Education Development Test (GED). Admission will not be offered unless a student has a high school diploma or a satisfactory GED Test score. (Students in this category include those whose high school class has graduated and those over the age of 18.) Students must also take the ACT if not previously taken. If the student has been out of high school for seven years or more, this requirement is waived.

General Registration. Students who do not qualify for enrollment into one of the academic colleges may be considered for enrollment in the Division of General Registration. These students include Utah residents who have graduated from high school with less than a satisfactory index number, non-Utah residents who have graduated from high school with less than a satisfactory index number, transfer students from other institutions of higher learning with less than a 2.2 GPA, and former USU students seeking readmission with less than a 2.0 GPA.

When a student has demonstrated ability to maintain a 2.0 GPA, that student may apply for admission to an academic college and department through the Director of General Registration. Regular college admissions evaluation procedures will then be made, and if there are no admissions restrictions, the student will be admitted to the department of his or her choice.

Advanced Placement. Students who present Advanced Placement examination scores of 3, 4, or 5 may receive 12 University credits for each Advanced Placement examination.

Credit by Special Examination. Students may challenge a course for credit by taking a special departmental examination which surveys knowledge of course content. Students who perform successfully on a challenge exam can receive credit for the course.

University credit is awarded for examinations in subjects the student has not taken. To determine which courses are available for challenge, a student should consult the appropriate academic department.

Credits earned by challenge exam cannot be used toward a graduate degree nor used to meet the resident requirement for graduation.

Application forms for permission to take special examinations are available in the Records Office, SC 246.

CLEP General Exams. Up to 46 credits may be acquired through the College Level Examination Placement (CLEP) general examinations. These credits may be used to fill general education requirements, but are not designed to meet specific course requirements.

CLEP Subject Exams. Many of the CLEP subject examinations are also accepted as equivalent to specific courses.

Admission Index

Test Scores

Enhanced Recentered ACT	SAT	GPA 4.0	3.9	3.8	3.7	3.6	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1
36	1600	142	140	139	137	135	133	132	130	128	126	124	123	121	119	117	116	114	112	110	108	107	105	103	101	100	98	95	94	93	91
35	1580	140	138	137	135	133	131	130	128	126	124	122	121	119	117	115	114	112	110	108	106	105	103	101	99	98	96	94	92	91	89
34	1530	138	136	135	133	131	129	128	126	124	122	120	119	117	115	113	112	110	108	106	104	103	101	99	97	96	94	92	90	89	87
33	1460	136	134	133	131	129	127	126	124	122	120	118	117	115	113	111	110	108	106	104	102	101	99	97	95	94	92	90	88	87	85
32	1410	134	132	131	129	127	125	124	122	120	118	116	115	113	111	109	108	106	104	102	100	99	97	95	93	92	90	88	86	85	83
31	1360	133	131	130	128	126	124	123	121	119	117	115	114	112	110	108	107	105	103	101	99	98	96	94	92	91	89	87	85	84	82
30	1320	131	129	128	126	124	122	121	119	117	115	113	112	110	108	106	105	103	101	99	97	95	94	92	90	89	87	85	83	82	80
29	1280	129	127	126	124	122	120	119	117	115	113	111	110	108	106	104	103	101	99	97	95	94	92	90	88	87	85	83	81	80	78
28	1240	127	125	124	122	120	118	117	115	113	111	109	108	106	104	102	101	99	97	95	93	92	90	88	86	85	83	81	79	78	76
27	1210	126	124	123	121	119	117	116	114	112	110	108	107	105	103	101	100	98	96	94	92	91	89	87	85	84	82	80	78	77	75
26	1170	124	122	121	119	117	115	114	112	110	108	106	105	103	101	99	96	95	94	92	90	89	87	85	83	82	80	78	76	75	73
25	1140	122	120	119	117	115	113	112	110	108	105	104	103	101	99	97	96	94	92	90	88	87	85	83	81	80	78	76	74	73	71
24	1100	120	118	117	115	113	111	110	108	106	104	102	101	99	97	96	94	92	90	88	86	85	83	81	79	78	76	74	72	71	69
23	1060	118	116	115	113	111	109	108	106	104	102	100	99	97	95	93	92	90	88	86	84	83	81	79	77	76	74	72	70	69	67
22	1030	117	115	114	112	110	108	107	105	103	101	99	98	96	94	92	91	88	87	85	83	82	80	78	76	75	73	71	69	68	65
21	990	115	113	112	110	108	106	105	103	101	99	97	96	94	92	90	89	87	86	83	81	80	78	76	74	73	71	69	67	66	64
20	950	113	111	110	108	106	104	103	101	99	97	95	94	92	90	88	87	85	83	81	79	78	76	74	72	71	69	67	65	64	62
19	910	111	109	108	106	104	102	101	99	97	95	93	92	90	88	86	85	83	81	79	77	76	74	72	70	69	67	65	63	62	60
18	860	109	107	106	104	102	100	99	97	95	93	91	90	88	86	84	83	81	79	77	75	74	72	70	68	67	65	63	61	60	58
17	820	108	106	105	103	101	99	98	96	94	92	90	89	87	85	83	82	80	78	76	74	73	71	69	67	65	64	62	60	59	57
16	770	106	104	103	101	99	97	96	94	92	90	88	87	85	83	81	80	78	75	74	72	71	69	67	65	64	62	60	58	57	55
15	720	104	102	101	99	97	95	94	92	90	88	86	85	83	81	79	78	76	74	72	70	69	67	65	63	62	60	58	56	55	53
14	670	102	100	99	97	95	93	92	90	88	86	84	83	81	79	77	76	74	72	70	68	67	65	63	61	60	58	56	54	53	51
13	600	100	98	97	95	93	91	90	88	86	84	82	81	79	77	75	74	72	70	68	66	65	63	61	59	58	56	54	52	51	49
12	540	99	97	95	94	92	90	89	87	85	83	81	80	78	76	74	73	71	69	67	65	64	62	60	58	57	55	53	51	50	48
11	480	97	95	94	92	90	88	87	85	83	81	79	78	76	74	72	71	69	67	65	63	62	60	58	56	55	53	51	49	48	46
10	430	95	93	92	90	88	86	85	83	81	79	77	76	74	72	70	69	67	65	63	61	60	58	56	54	53	51	49	47	46	44
9	400	93	91	90	88	86	84	83	81	79	77	75	74	72	70	68	67	65	63	61	59	58	56	54	52	51	49	47	45	44	42
8	380	92	90	89	87	85	83	82	80	78	76	74	73	71	69	67	65	64	62	60	58	57	55	53	51	50	48	46	44	43	41
7	350	90	88	87	85	83	81	80	78	76	74	72	71	69	67	65	64	62	60	58	56	55	53	51	49	48	46	44	42	41	39
6	320	88	86	85	83	81	79	78	76	74	72	70	69	67	65	63	62	60	58	56	54	53	51	49	47	46	44	42	40	39	37
5	290	86	84	83	81	79	77	76	74	72	70	68	67	65	63	61	60	58	56	54	52	51	49	47	45	44	42	40	38	37	35

For a complete list of examinations accepted and scores necessary to receive credit, inquire at Testing Services, University Inn 115, 797-1004.

Credit for Military Service. The University may grant credit to students currently enrolled at the University who have served in the armed forces. Applications for credit are made by submitting the DD214 or DD295 form to the Office of Admissions.

Veterans Educational Benefits. Veterans or qualified dependents of disabled or deceased veterans who may be eligible for Veterans Educational Benefits should contact the Office of Veterans Affairs, or telephone 797-1102 for information concerning their educational benefits. Veterans or eligible dependents must make application for admission and be matriculated in a degree program.

Transfer Student Admission. Students who transfer to USU with 45 or more credits earned at another accredited institution will be accepted in good standing if they have a cumulative GPA of 2.2 or higher. Those applying to a major with a higher grade point requirement will be admitted as an "Undeclared" major until they meet the GPA requirement. Transfer students who have a cumulative GPA between 2.0 and 2.2 will be referred to the dean of the college of their choice for evaluation and possible admission to that college. Transfer students with more than 45 credits and with less than a 2.0 GPA will be considered for admission to General Registration on an individual basis (if they have less than 235 total credits).

Transcripts of credit must accompany applications for admission when submitted by students who have attended other collegiate institutions. Transcripts submitted for admission become the property of the University and are not returned. *Transcripts from all institutions previously attended are required.*

At its discretion, the University may accept transfer credit from accredited and nonaccredited institutions and miscellaneous sources. These may include:

(1) accredited institutions, (2) foreign universities, (3) U.S. military credit for approved job and educational experiences, (4) credit by examination, (5) miscellaneous sources: internships, nontraditional learning experiences.

The following evaluation criteria for acceptance will be used:

(1) accreditation status of the institution, (2) recognized national standards published by the American Association of Collegiate Registrars and by the American Council on Education, (3) guidelines given by the State Board of Regents (including guidelines for CLEP and AP credit), (4) recommendations given by various University units having appropriate academic competence, including: Faculty Senate, college and departmental curriculum committees.

Utah State University does not accept transfer credit from nonaccredited institutions in those cases where USU lacks an academic unit to evaluate such transfer credits.

Credit Transfer Policy of Utah System. An Associate of Arts or an Associate of Science degree earned at any institution within the Utah System of Higher Education, or at other non-Utah institutions with articulation agreements, will be considered as meeting the General Education requirement of any institution in the system. When the General Education requirements of an institution not offering the Associate of Arts or Associate of Science degree have been met in earning a 93 to 96 credit hour diploma, a Registrar's certification that the transferring student has completed baccalaureate-level General Education requirements at the sending institution will be accepted by the receiving USHE institution in lieu of the AA/AS degree. In the latter case, the Registrar at the sending institution will forward to the receiving institution an up-to-date description of the General Education requirements.

Credit for courses numbered 100 or above earned in the Utah System of Higher Education is transferable within the System and will be carried on the student's transcript by the receiving institution. **Acceptance of credit should not be confused with its application. Transfer credit may or may not apply to the graduation requirements of an institution, regardless of the number of credits transferred.** Credit other than that intended wholly to meet the General Education requirements of the receiving institution will be applied on the basis of the appropriateness of credit to a particular institution's specific degree program requirements as determined by the receiving institution.

International Undergraduate Student Admission. The following fees, documents, and information should be submitted to the Admissions Office three months prior to the beginning of the quarter for which an international student wishes to be considered for admission:

1. Utah State University application for admission for students outside the United States and a $35 application fee.

2. One copy of official transcripts and certificates or certified true copies for each secondary school, college, and university attended with official English translation of all documents.

3. Evidence of financial capability must be provided with the application, as specified on the application form.

4. International students must be proficient in the use of English. Proficiency is determined for undergraduates by a minimum TOEFL score of 500, or a Michigan test score of 80, or by passing level 4 (advanced level) of the Intensive English program at Utah State University. For graduate students, proficiency is determined by a minimum TOEFL score of 550, or passing level 4 (advanced level) of Intensive English at Utah State University.

Qualified students in level 4 (advanced level) of Intensive English may take one or more academic courses if approved by the Intensive English staff and their University adviser. Graduate students need the additional approval of the Dean of Graduate Studies. Students at any level may audit academic courses with approval of the Intensive English staff.

Failure to carry a full course of study (at least 12 credit hours per quarter for undergraduates), or failure to make satisfactory progress towards the receipt of an undergraduate or advanced degree, or failure to comply with any other immigration requirements for students attending USU, will be grounds for suspension or dismissal in accordance with existing University policy.

Graduate Admission. Any student who has graduated from USU or any other university must apply to the School of Graduate Studies for admission and present two copies of an official transcript.

Readmission. Former students of the University returning after an absence of one or more quarters are required to file applications for readmission at least one week prior to the first day of the quarter.

The stop-out. Students in good standing who interrupt their educational experience will be subject to all department, college, and/or University policies by meeting requirements in effect at the time they return. Some noncollegiate experiences may permit credit through challenge and foreign language examinations.

Students who were in attendance the previous spring quarter are not required to reapply for fall quarter unless suspension or graduation occurred at the conclusion of the spring quarter.

Students who have been denied admission to the University may appeal the decision by contacting the Admissions Office, SC 246. The appeal must be made no later than seven calendar days from the first class day.

Residency Application and Appeal. Nonresident students who feel they have met the requirements for instate resident student status must file an official residency application with the Residency Office, Taggart Student Center 246, no later than seven calendar days from the first class day and **not more than 30 days before the beginning of the quarter for which residency is sought.** Those missing the application deadline will have residency considered for the next quarter, provided that the next appropriate deadline is met with adequate updated documentation.

If an application is denied by the Residency Officer, the student may appeal to the Residency Appeals Committee no later than the tenth class day of the quarter. Appeals cannot be considered after this deadline.

Procedures concerning residency are as follows:

1. Persons claiming residency on their application for admission, but who are coded nonresident, will be notified in writing of their nonresident status.

2. Definition of a resident student

(a) Students who attend the University on a full-time basis are presumed to have moved to Utah for the purpose of attending an institution of higher education and are nonresidents for tuition purposes. The burden of rebutting this presumption is upon the person seeking resident status. Mere presence in the state is not sufficient for establishing residency. This presence must be coupled with clear and convincing evidence that a person has established a domicile in the state beyond the circumstance of being a student and that the student does not maintain a residence elsewhere.

(b) Aliens who are present in the United States on visitor, student, or other visas which authorize only temporary presence in this country do not have the capacity to intend to reside in Utah for an indefinite period and therefore must be classified as nonresident.

(c) Aliens who have been granted immigrant or permanent resident status in the United States shall be classified for purposes of resident status according to the same criteria as citizens.

(d) Any American Indian who is enrolled on the tribal rolls of a tribe whose reservation or trust lands lie partly or wholly within Utah or whose border is at any point contiguous with the border of Utah or any American Indian who is a member of a federally recognized or known Utah tribe and who has graduated from a high school in Utah, shall be entitled to resident status.

3. Handouts listing the policy and deadlines will be provided to students who inquire about residency.

Western Undergraduate Exchange. Utah State University participates in the Western Undergraduate Exchange (WUE), a program of the Western Interstate Commission for Higher Education. Through WUE, certain students who are not residents of the state of Utah may enroll at Utah State University in designated programs, paying resident tuition plus 50 percent of that amount (plus other fees that are paid by all students).

Because Utah State University participates, residents of Utah may enroll under the same terms in designated institutions and programs in other participating states.

Information about WUE programs available at Utah State University may be obtained from the Admissions Office, SC 246, UMC 1600, tel. (801) 797-1107. Utah residents may obtain information about WUE programs in other states from the Certifying Officer for Utah WICHE Student Exchange Program, #3 Triad Center, Suite 550, 355 West North Temple, Salt Lake City, Utah 84180-1205, tel. (801) 538-5247 or from WICHE Student Exchange Program, P.O. Drawer P, Boulder, Colorado 80201-9752, tel. (303) 497-0210.

Cooperative education and/or internships. Cooperative education involves faculty and employers in a partnership to provide a student with a blend of academic and on-the-job experiences. Interested students should contact their academic department or the Office of Cooperative Education, UI 102.

Fees and Refunds

Registration for a quarter is not complete until all fees have been paid and a fee receipt has been prepared by the cashier.

Tuition and Student Body Fees per Quarter[1]

UNDERGRADUATE STUDENTS

Credits	Utah Resident	Nonresident[2]	International Students[3]
1	$137	$ 387	$ 412
2	178	526	551
3	222	668	693
4	267	811	836
5	311	953	978
6	354	1094	1119
7	445	1283	1308
8	488	1424	1449
9	532	1566	1591
10	577	1709	1734
11	616	1846	1871
12	655	1983	2008
13	694	2120	2145
14	694	2120	2145
15	694	2120	2145
16	694	2120	2145
17	694	2120	2145
18	694	2120	2145
19	733	2257	2282
20	772	2394	2419
21	811	2531	2556
22	850	2668	2693
23	889	2805	2830
24	928	2942	2967
25	967	3079	3104

Note: Over 25 credits, additional tuition is $39 per credit hour for undergraduate residents.

Over 25 credits, additional tuition is $137 per credit hour for undergraduate nonresidents.

GRADUATE STUDENTS

Credits	Utah Resident	Nonresident[2]	International Students[3]
1	$147	$423	$448
2	192	575	600
3	240	730	755
4	289	886	911
5	337	1041	1066
6	384	1195	1220
7	479	1397	1422
8	526	1551	1576
9	574	1706	1731
10	623	1862	1887
11	666	2012	2037
12	709	2162	2187
13	752	2312	2337
14	752	2312	2337
15	752	2312	2337
16	752	2312	2337
17	752	2312	2337
18	752	2312	2337
19	795	2462	2487
20	838	2612	2637
21	881	2762	2787
22	924	2912	2937
23	967	3062	3087
24	1010	3212	3237
25	1053	3362	3387

Note: Over 25 credits, additional tuition is $43 per credit hour for graduate residents.

Over 25 credits, additional tuition is $150 per credit hour for graduate nonresidents.

The University reserves the right to alter any tuition or fee charges without notice.

Visitor fee (audit) ..... same as classes with credit (except for persons 62 years of age or older who are permitted to audit free of charge after a recording fee of $10.00 per quarter has been paid)

Late registration fee **$20**
beginning the first day of classes

Continuing Graduate Advisement (699 and 799). 1 credit $157
3 credits—$250

Continuing Graduate Registration Fee $10

[1]These fees are effective Spring Quarter 1996.
[2]Other U.S. citizens and immigrants
[3]Non-U.S. citizens and immigrants

Refund Policy

Carefully note the below refund policy: **Refund Period**	**Percent of Tuition to be Refunded**
Before Quarter Classes Begin	100%
First 2 Days of the Quarter	100%
3rd thru 5th Day of Classes	90%
Thru the 10th Day of Classes	70%
Thru the 15th Day of Classes	50%
After the 15th Day of Classes	0%

Fee Refunds. (1) Ten dollars of every registration fee and the insurance fee are nonrefundable. (2) After the $10 fee above is deducted from the registration fee, a proportionate share of all fees paid may be refunded to any student who withdraws from school before the end of the third week of the session. (3) All refunds will be mailed to the student. (4) The application and evaluation fee of $35 is not refundable.

Delinquent Financial Accounts. Students with outstanding financial obligations may be refused all University services until such obligations are paid. Services which may be denied include the following: registration, transcripts, transfer of credit, and graduation.

Activity Validation Sticker. An activity validation sticker is included for students registering for 7 or more credits. Students registered for less than 7 credits may purchase an activity validation sticker for $40.00. A student who holds an activity validation sticker may purchase an additional validation sticker for his or her spouse for $20.00. A lost activity validation may be replaced for $5.00.

ID Cards. An ID card will be prepared for new freshmen and transfer students upon proof of fee payment. Lost ID cards may be replaced for $5.00. ID cards are to be validated each quarter by the cashier with an activity validation sticker when tuition and fees are paid.

Dishonored Checks. All dishonored checks will be collected by Check Rite. In addition to the original check amount, a service charge of $15 will be collected.

Deferred Fee Note Fee. $22.00 per deferred fee note. An additional note fee of 12 percent per annum will be assessed from the date of the note until paid if the deferred fee note becomes delinquent.

Special Fees. Special fees are in addition to tuition and registration fees. Carefully review the University *Schedule of Classes* to determine courses which require special fees.

Parking Permits

Parking Permits for students ..... $10 per quarter
$25 per year

Parking Permit for students living in dorms ..... $25 per year

Parking permits for students living in the Student Living Center or Aggie Village ..... $3 per year

Gate Card ..... $5 deposit

Music

Piano practice fees (one hour per day for the quarter) payable at Department $25

Private instruction (per credit) payable at time of registration $110

Division of General Registration Fee ..... $30 per quarter

Health and Accident Insurance is available to all students for nominal costs at the time of registration. Additional insurance may be purchased for spouse and children. Insurance coverage is mandatory for international students. Students are encouraged to provide themselves with adequate protection in case of illness or serious injury. See University *Schedule of Classes* for premiums.

Insurance Information/International Students

All international students attending Utah State University are required to purchase one of the student health insurance plans offered at the University for themselves and accompanying dependents. Insurance coverage is required each quarter.

International students are cautioned to purchase only temporary travel insurance to cover travel to the U.S.

Admission Application and Evaluation Fee (nonrefundable):
U.S. Residents (undergraduate) $35
Foreign Students (undergraduate) $35

Special Examination Fee: $10 per course plus $5 per credit hour up to a maximum of $50 including the $10 examination fee.

Late Graduation Application Fee for undergraduate candidate $10

Graduation Fee:
One-year Certificate $10
Two-year Diploma $10
Associate of Applied Science Degree $10
Bachelor's Degree $10
Advanced Degree $15

Cap and Gown Rentals:
Bachelor's Degrees $16
Master's Degrees $19
Doctor of Philosophy or Education $19

Teacher Placement Registration $10

Transcript of Credits. The transcript fee (per transcript) is $3 for the first transcript and $1 for each additional transcript *on the same order.* The fee is to be paid in the Office of the Registrar (Records Services), Taggart Student Center 246.

University Publications. To obtain a Utah State University *Undergraduate Catalog* ($5.00), Quarterly *Schedule of Classes* ($2.50), or *Graduate Catalog* ($3.00) phone Express-a-book at one of the following numbers: 1-(800) 662-3950, (801) 797-0813, or FAX (801) 797-3793.

Information on Scholarships, Fellowships, and Assistantships can be found in the Financial Aid and Scholarship Information section of this catalog (p. 239-252).

Housing Fees. Write for a Housing Bulletin; send request to the Office of Housing and Residential Life, Utah State University, Logan, Utah 84322-8600.

Estimated Cost of Education for Three Quarters—1995-96 Academic Year

	Resident	Nonresident
Tuition and General Fees	$1,995	$6,045
Room and Board	4,305	4,305
Books and Supplies	720	720
Personal Expenses	1,500	1,500
Transportation	1,050	1,050
Totals	$9,570	$13,620

Registration

Office of the Registrar: SC 246, 797-1094

All students attending classes must be registered. Students are officially registered when all tuition and fees have been paid in full. Failure to pay tuition and fees by the published fee payment deadline will result in courses being voided. Detailed registration instructions are printed in the University *Schedule of Classes,* which is published quarterly.

Eligibility. Only eligible students may register for courses at the University. An eligible student is either continuing from the previous quarter or has been admitted or readmitted to the University.

Registration Procedures. The University *Schedule of Classes* lists each quarter's course offerings, dates, times, places, and procedures for registration and fee payment.

Late Registration. A $20 late registration fee is assessed beginning the first day of classes. Students must complete registration by the end of the third week of the quarter.

Assignment of Adviser. When students have been admitted to the University and have indicated their proposed major field of study, their names are forwarded to the dean of the college concerned. The dean will assign advisers who will assist in registration and career planning. Students may also receive assistance from their college or the University Academic Service Center.

Full-time Status. The minimum registration load for a full-time undergraduate student is 12 credits. To be eligible for student body offices, students are required to be registered for 10 or more credits. Veterans and students eligible for a veteran's educational allowance are required to be matriculated and registered for 12 or more credits to qualify for full educational benefits.

Auditing Classes. Those who wish to audit a class must register as auditors. Auditing is dependent on space, resource availability, and instructor approval. No credit will be allowed for attendance, and the regular fee will be assessed. At no future time may the student request or receive credit for the audited course by any other means than by officially registering for the course and doing the required work. Audit requests, approved by the instructor, must be submitted to the Office of the Registrar and fees paid at the Cashiers Office before class attendance is permitted. Students are not permitted to register as auditors during Early Registration.

House Bill 60 permits Utah residents 62 years of age or older to audit regular university classes offered during the day or offered through the Extension Class Division. However, space in many university classes is limited. Classes which are full at the time of an audit request are unavailable. Credit seeking, full tuition paying students shall have first priority in the registration process. A flat fee of $10.00 per quarter is charged for House Bill 60 registration.

Pass *(P), D+, D, F* Option. Students may register for a Pass *(P), D+, D, F* option. The grade of Pass *(P)* indicates academic achievement of not less than *C-*. The Pass *(P)* grade is not calculated into a student's grade point average. (See Records section for more information.)

Adding Courses. Courses may be added through the 15th day of classes. The instructor's signature is required beginning the sixth day of classes. Following the 15th day of classes, the student's academic dean must also approve any add request.

Dropping Courses. Students may drop courses without limit and without notation on the permanent record through the fifth day of classes or the second meeting, whichever is later. From the sixth through the 30th day of classes, students may drop, without notation on the permanent record, no more than eight courses prior to completion of the first undergraduate degree, and no more than two courses during each additional degree program. Beginning with the 31st day of classes, courses dropped will be entered on the student's permanent record and reflect a *W* (withdraw). Instructors are to provide students in undergraduate classes with

significant feedback on their performance in the class (e.g., the results of at least one examination or evaluation of performance on some other major requirement(s)) prior to the 31st day of classes. Students who fail to attend class the first five days of school may be dropped from that class by the instructor. (*This does not remove the responsibility of the student to drop classes which he or she does not plan to attend*). Students receiving Veterans Educational Benefits must notify the Office of Veterans Affairs of any change in their registration. Following the 30th day of classes, or when the allowed number of drops from the sixth through the 30th day has been reached, the student's instructor and academic dean must approve any drop request and this may be done only upon demonstration of conditions beyond the student's control. The term "conditions beyond the student's control" includes (1) incapacitating illnesses which prevent a student from attending classes for a period of at least two weeks; (2) a death in the immediate family; (3) financial responsibilities requiring a student to alter course schedule to secure employment; (4) change in work schedule as required by employer; or (5) other emergencies of this nature. Documentation of the circumstances cited to justify dropping after the deadline is required. Under no circumstances is dropping a course after the 30th day, or from the sixth through the 30th day after the limit has been reached, permitted for the purpose of avoiding an unsatisfactory grade; neither shall *I* grades be given to avoid the consequences of inadequate performance. Appeal to the dean's decision may be directed to the Provost's Office. (For transition drop policy, see the current University *Schedule of Classes*.)

Withdrawal from the University. The student must initiate an official withdrawal from the University by appearing in person or by addressing a signed request to the Office of the Registrar. No one will be permitted to withdraw from the University once final examinations have begun. The date of the official withdrawal is the date the withdrawal form or letter is received.

No-test Days. A five-day period designated as No-test Days precedes the four days of final examinations which are normally scheduled at the close of each academic quarter. During No-test Days neither final examinations nor testing of any kind will be given in order that students may concentrate upon classwork, the completion of special assignments, writing projects, and other preparation for duly scheduled final examinations.

Proof of Identification. In order to receive University services, photo identification must be presented. Each admitted student who completes the registration process for a regular quarter will be issued a student identification card. This photo identification card is valid for the duration of the student's enrollment at Utah State University. Photo IDs are issued throughout the quarter in the Taggart Student Center, Room 204.

Change of Address. It is the responsibility of the student to keep the Office of the Registrar informed of address changes.

Records

Office of the Registrar: SC 246, 797-1116

The custodian of educational records at Utah State University is the Office of the Registrar.

Student Classification. At the beginning of each quarter, students are classified for that quarter as follows:

Credit Hours Earned	Classification
0-44	Freshman
45-89	Sophomore
90-134	Junior
135 and over	Senior

Credit Enrollment. The quarter hour is the unit upon which credit is computed. It represents one fifty-minute class period per week per quarter or three hours of laboratory work each week for one quarter. To obtain credit, a student must be properly registered and pay fees for the course.

Privacy Rights

The Family Educational Rights and Privacy Act, a federal law commonly referred to as *FERPA* or the *Buckley Amendment*, (1) provides that students will have access to inspect and review their educational records and (2) protects the rights of a student to privacy by limiting access to the educational record without express written consent.

Definitions. A **student** is defined as any individual who is attending or has attended Utah State University. (Note: Certain rights are extended to the parent(s) of a dependent student, where dependency is defined by Section 152 of the Internal Revenue Code of 1954.) An **educational record** is any record (1) directly related to a student, and (2) maintained by Utah State University or by an agent of the University.

Notices. With respect to a student's educational records, FERPA affords a student the right: (1) to inspect and review the student's educational records; (2) to request the amendment of the student's educational records to ensure that they are not inaccurate, misleading, or otherwise in violation of the student's privacy or other rights; (3) to consent to disclosures of personally identifiable information contained in the student's educational records, except to the extent that FERPA authorizes disclosure without consent; (4) to file with the U.S. Department of Education a complaint concerning alleged failures by Utah State University to comply with the requirements of FERPA, if a complaint cannot be resolved within the University; and (5) to obtain a copy of the *Student Records Policy and Procedures for Utah State University*. (Copies are available at the Registrar's Office, Student Center 246.)

Categories of Records. There are two categories of educational records under FERPA. **Directory information** (or releasable information) is general information that may be released to anyone without the consent of the student, unless the student indicates otherwise. **Personally identifiable information** (or nonreleaseable information) includes all information not defined as directory information and may not generally be released without consent of the student.

Utah State University has designated the following as **directory information** for a student:

Releasable Information/Directory Information

Name
Local and permanent address
Telephone number
Date of birth
Residency status
Degrees and awards received
Most recent institution attended by the student
Academic level
Major field of study
Department or college
Participation in officially recognized activities/sports
Dates of attendance and graduation
Weight/height of members of athletic teams
Current quarter schedule of classes

Nonreleaseable Information/All Other Information

Students may control the release of directory information by completing forms at the Registrar's Office. Students accessing educational records must provide identification. It is important to **note** that, for educational purposes, University officials have access to all student records.

Grading

For work in graded courses, *A* shall denote exceptional performance, *B* above average performance, *C* satisfactory performance, *D* poor performance, and *F* failing performance. Letter grades may be modified by plus (+) or minus (-) symbols (no *A*+ or *D*-).

A	4.00	C+	2.33	F	0.00
A-	3.67	C	2.00		
B+	3.33	C-	1.67		
B	3.00	D+	1.33		
B-	2.67	D	1.00		

Scholastic Marks are as follows:

I	Incomplete	P	Pass
W	Withdrawal	AU	Audit

Grade Points. For the purpose of computing the grade point average, grade points are assigned to each of the grades for each quarter as noted above (*A*, 4 points; *A*-, 3.67 points; *B*+, 3.33 points; etc.). Grade point averages are rounded to the nearest hundredth of a grade point.

Grade Point Average. The grade point average (GPA) is obtained by dividing the total number of grade points earned by the number of graded credit hours carried. The *P* (Pass) grade and *I* (Incomplete) grade do not carry a grade point value and are not calculated into the GPA. Quarter GPA is based on quarter total credit hours carried. Total GPA is based on total credit hours carried.

Grading Options. Ordinarily a letter grade is given upon completion of a course, unless a grading option of "Audit" or "Pass/D+, D, F" is indicated at the time of registration or within prescribed deadlines.

***Pass/D+, D, F* Option.** Under this option, the grade of *P* indicates academic achievement of not less than *C*-. All students, including freshmen, may take courses on a *P/D+, D, F* basis. A minimum of 115 of the 186 credits required for the baccalaureate degree shall carry the *A, A-, B+, B, B-, C+, C, C-, D+, D* designation, unless the major department and college change this limitation. All CLEP, AP, and other special examination credits are considered *P* and are included in the total *P* grades permitted. Students exercise the *P/D+, D, F* option by submitting a request to the Office of the Registrar by the twenty-fifth class day of the quarter. The *P* shall also be used to record on the student's permanent academic record all special credit in which other grades are inappropriate. Students should note that *P* grades may not be

accepted by some departments for major requirements, nor by some professional or graduate schools.

Incomplete *(I)* Grade. Students are required to complete all courses for which they are registered by the end of the quarter. In some cases, a student may be unable to complete all of the coursework because of extenuating circumstances, but **not** due to poor performance or to retain financial aid. The term "extenuating" circumstances includes: (1) incapacitating illness which prevents a student from attending classes for a minimum period of two weeks, (2) a death in the immediate family, (3) financial responsibilities requiring a student to alter course schedule to secure employment, (4) change in work schedule as required by employer, or (5) other emergencies deemed appropriate by the instructor. The student may petition the instructor for time beyond the end of the quarter to finish the work. If the instructor agrees, two grades will be given, an "I" and a letter grade for the course computed as if the missing work were zero. Documentation of the circumstances cited to justify an incomplete grade is required.

The student is required to complete the work by the time agreed upon, or not longer than 12 months. If no change of grade is submitted by the instructor within the prescribed period, the "I" will be removed and the letter grade originally submitted with the "I" will remain as the permanent grade for the course. Arrangements to complete the missing coursework are to be made directly with the instructor awarding the "I" grade, and in accordance with departmental policy. In the absence of the original instructor, special circumstances must be handled by the department head. Documentation of required work to be completed in order to remove the "I" grade must be filed with the department office. The "I" grade should generally not require a complete repeat of the course. **A student should not reregister for the course.**

Repeating Courses. Students may repeat any course for which they have previously registered. However, the number of times a student can take the same class is limited to a total of three times (once, plus two repeats). Beyond three attempts, the student's dean must approve additional registration for the class.

The total number of repeats allowed is limited to ten. Students who exceed this limit will have an academic hold placed on their registration. Beyond ten repeats, the student's academic dean must approve additional registration for the class.

This policy does not apply to courses repeatable for credit. When a course listed in the *Undergraduate Catalog* is identified with the Repeat Symbol (®), the course may be taken more than once for credit.

When a course is repeated, the most recent grade and credit hours are used to recalculate the student's grade point average. The previous grade and credit hours for the same course will remain on the student's academic record, but will not be calculated in the grade point average or total credit hours completed. This option is also available for courses designated as repeatable (®). The student is responsible to declare repeated courses to the Registrar's Office by completing a Record Adjustment-Repeated Course form.

Change of Grades. The instructor of a course has the sole and final responsibility for any grade reported. Once a grade has been reported to the Office of the Registrar, it may be changed upon the signed authorization of the faculty member who issued the original grade. This applies also to the grade of Incomplete (*I*). (See USU Student Policy Handbook—Student Appeal Procedures.)

Final Grade Report. A current transcript will be made available at no charge to each student at the end of each quarter. If students wish their grades sent to them, they must make the request in person at the Records Office.

Records Hold. The Office of the Registrar will place a "Records Hold" on the records of a student when an outstanding financial obligation or disciplinary action has been reported.

When a "hold" is placed on a record, the following results may occur: (1) An official and/or unofficial transcript may not be issued; (2) registration privileges may be suspended; (3) other student services may be revoked. The "hold" will remain effective until removed by the initiating office. It is the student's responsibility to clear the conditions causing the "hold."

Transfer Credit. The grades which may be transferred and recorded for transfer students shall include but not be limited to *A, A-, B+, B, B-, C+, C, C-, D+, D,* and *F*. Only grades earned at USU will be used in calculating USU grade point averages. Decisions concerning academic standing, once the student is admitted to USU, will be based solely on USU grades.

Remedial Courses. Courses numbered 001-099 will not satisfy baccalaureate requirements, are not transferable, and are not calculated in a student's grade point average.

Academic Warning, Probation, and Suspension. *A student shall be on warning status* at the end of the quarter in which his or her USU total undergraduate grade point average is 4 grade points less than a 2.0 grade point average. The student shall remain on warning status until his or her USU total undergraduate grade point average rises to or exceeds 2.0.

A student shall be placed on probation at the end of the quarter in which his or her USU total undergraduate grade point average is 12 or more grade points less than a 2.0 grade point average. The student shall remain on probation until his or her USU total undergraduate grade point average rises to or exceeds 2.0. Following the quarter for which a student is placed on probation, *the student shall be notified of his or her status by correspondence from the appropriate academic dean. The student will be instructed to meet with his or her adviser before the end of the fifth week and to sign a statement acknowledging the terms of the probation. Signed statements shall be maintained in the academic dean's office.*

A student on probation shall be suspended at the end of the quarter in which his or her grade point average for the quarter is less than 2.0.

A student who is suspended for the first time must lay out of the University for at least one quarter before being considered for readmission (unless the student is retained by his or her academic dean or by the Division of General Registration). A student who has been suspended two or more times will not be considered for readmission to the University for at least one year following the student's last suspension. A student who is readmitted after being suspended is required to enroll in the Division of General Registration.

Academic Renewal

An undergraduate who has been admitted to the University after an absence of at least five years may petition the Director of Admissions and Records for academic renewal. Students may petition by requesting their academic record be reviewed in order to recalculate their grade point average in all courses where grades of *D+* or lower were earned five or more years prior to the petition. After admission, but before application for renewal, the student must have completed one of the following at Utah State University:

(A) 15 credit hours with at least a 3.00 GPA.
(B) 30 credit hours with at least a 2.75 GPA.
(C) 45 credit hours with at least a 2.50 GPA.

The credit hour/GPA requirement is waived for students with an absence of 10 years or more. Courses will remain on the transcript unaltered and will not be considered in satisfying requirements for graduation. Academic renewal may be applied only once and is irreversible. The academic renewal policy does not apply to graduate students or students seeking a second undergraduate degree. A $25 evaluation fee will be assessed.

Academic Honesty

The University expects that students and faculty alike maintain the highest standards of academic honesty. For the benefit of students who may not be aware of specific standards of the University concerning academic honesty, the following paragraph is quoted from the *Student Policy Handbook,* Article V, Section 3, Paragraphs a, b, and c:

Section 3. Violations of University Standards

A. The following activities have been found to interfere with University functions or threaten the well-being and the educational purposes of students and are, therefore, specifically prohibited and make the student subject to discipline. The following list of violations is not an all inclusive list; other misconduct may also subject the student to discipline.

1. Acts of academic dishonesty.
   a. Cheating includes intentionally: (1) using or attempting to use or providing others with any unauthorized assistance in taking quizzes, tests, examinations, or in any other academic exercise or activity; (2) depending upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; (3) substituting for another student, or permitting another student to substitute for oneself, in taking an examination or preparing academic work; (4) acquiring tests or other academic material belonging to a faculty member, staff member, or another student without express permission.
   b. Falsification includes the intentional and unauthorized altering or inventing of any information or citation in an academic exercise or activity.
   c. Plagiarism includes knowingly representing, by paraphrase or direct quotation, the published or unpublished work of another person as one's own in any academic exercise or activity without full and clear acknowledgement. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.

Violations of the above policy will subject the offender to the University discipline procedures as outlined in Article VI, Section 1 of the *Handbook.*

A. The penalties or disciplinary measures which the University may impose on a student include:
   1. Warning or reprimand—written or verbal.
   2. Grade adjustment—for either an assignment/test or the course.
   3. Probation—continued attendance at the University predicated upon the student satisfying certain requirements as specified by the University. Probation is for a designated period of time and includes the probability of more severe disciplinary penalties if the student does not comply with the specified requirements or is found to be violating any University regulations during the probationary period.
   4. Suspension—temporary dismissal from the University for a specified time, after which the student is eligible to return. Conditions for readmission may be specified.
   5. Expulsion—permanent dismissal from the University.
   6. Extra fee assessments.
   7. Payment of restitution to the University or, when University intervention is deemed appropriate, to another individual for damages or losses.
   8. Withholding of transcripts for refusal to return University property, pay University debts, or other violations of University standards.
   9. Denial or revocation of degrees.
   10. Performance of community service.
   11. Referral to psychological counseling or to the Office of Substance Abuse Prevention/Education for assessment, evaluation, education, and treatment, when necessary.

B. More than one of the penalties or disciplinary measures may be imposed for any single violation. Reference to "penalty" includes multiple penalties.

C. Imposition of the penalty of suspension or expulsion from the University must be aproved by the University president. The president's approval shall be given either at the conclusion of the 10-day appeal period if no appeal is filed, or as part of the president's final decision if an appeal is filed.

D. When a student is suspended or expelled from the University, tuition and fees that have been paid for the quarter during which the suspension or expulsion occurs are refundable in accordance with the standard refund policy as stated in the quarter *Schedule of Classes.*

E. A "packet hold" is not an independent penalty or disciplinary measure, but may be utilized by the University as a means to either direct a student's attention to, and subsequent participation in, a pending disciplinary (or grievance) proceeding, or to obtain the student's compliance with penalties or disciplinary measures which have been imposed, or other action which has been taken, under the Student Code.

Honor Roll (Dean's List). To qualify for the quarter honor roll (Dean's List), a student must earn a 3.5 GPA in 15 or more graded credits except for summer quarter, which is 12 graded credit hours. Scholarship "A" pins are presented to undergraduate students who have received all *A* grades (4.0 GPA) for 15 or more graded credits each quarter for three consecutive quarters in residence.

Graduation Requirements

The University offers an Associate of Applied Science degree, the degrees of Bachelor of Arts, Bachelor of Fine Arts, Bachelor of Landscape Architecture, Bachelor of Music, Bachelor of Science, Master of Arts, Master of Science, Master of Accounting, Master of Business Administration, Master of Community Economic Development, Master of Education, Master of Engineering, Master of Engineering Science, Master of Fine Arts, Master of Social Sciences, Master of Forestry, Master of Landscape Architecture, Master of Mathematics, Civil Engineer, Electrical Engineer, Educational Specialist, Doctor of Education, and Doctor of Philosophy, and provides coursework which will satisfy requirements for all professional certificates issued by the State Board of Public Instruction. Certificates and diplomas are offered for one- and two-year programs in certain departments.

Students are expected to familiarize themselves with the rules and regulations of both the University and their specific major. Detailed information concerning graduation requirements is available in this catalog as part of the department descriptions. *Responsibility for satisfying all graduation requirements rests upon the student. Utah State University reserves the right to change graduation requirements at any time. Changes are not applied retroactively to students already admitted to the University or to their major.*

Certificates, Diplomas, and Associate of Applied Science Degrees

Certificates, diplomas, and Associate of Applied Science degrees are awarded for completion of less-than-baccalaureate programs at Utah State University. As defined by the Utah State Board of Regents, a certificate is awarded upon the successful completion of a program directly oriented toward job entry when the program is of a duration of 18 months or less (1-72 quarter credit hours). The Regents define a diploma or Associate of Applied Science program as one directly oriented toward job entry when the program is of a duration of 19-36 months (74-144 quarter credit hours).

The Colleges of Agriculture, Business, Engineering, and Humanities, Arts, and Social Sciences offer one- and two-year programs leading to certificates, diplomas, and Associate of Applied Science degrees. One-year certificate programs are available in dairy technology, agricultural machinery technology, swine management, and ornamental horticulture. Diplomas and Associate of Applied Science degrees include aeronautics, technical drafting, agricultural machinery technology, office systems support, and ornamental horticulture.

In most cases, the courses in the diploma and Associate of Applied Science programs are arranged so that, at a later date, the four-year baccalaureate program can be completed with a minimum loss of time.

Associate of Applied Science Degree

A minimum of 96 credit hours is required for an Associate of Applied Science degree. Requirements include coursework in the following areas: primary area of study, related area, general education, and electives.

See department offerings for specific requirements. Associate of Applied Science degrees are offered in the following areas: aeronautics, technical drafting, office systems support, ornamental horticulture, and agricultural machinery technology.

Bachelor's Degrees

The University confers the baccalaureate degree upon students who meet the specified requirements of any of the eight resident colleges.

Graduates of the Colleges of Engineering and Natural Resources are eligible to receive the Bachelor of Science degree. The Bachelor of Arts degree is not offered in these colleges, with the exception of the Department of Geography and Earth Resources, where Bachelor of Science and Bachelor of Arts degrees are offered.

Graduates of the Colleges of Agriculture, Business, Education, Family Life, and Science may be awarded the Bachelor of Science degree or the Bachelor of Arts degree as recommended by the student's individual department and approved by the dean of the college.

Graduates of the College of Humanities, Arts and Social Sciences may be awarded the Bachelor of Science Degree, the Bachelor of Arts degree, the Bachelor of Fine Arts degree, the Bachelor of Landscape Architecture degree, or the Bachelor of Music degree as recommended by the student's individual department and approved by the dean of the college.

All graduates, regardless of the type of degree, must satisfy University requirements in American Institutions and the college requirements in General Education and Communication Skills.

Bachelor of Arts and Master of Arts Degrees

All students who receive the Bachelor of Arts degree or the Master of Arts degree must have completed two years' training or equivalent in a foreign language approved by the Languages and Philosophy Department. One year or equivalent in each of two foreign languages may also satisfy the foreign language requirement for the BA and MA degrees. Specifically, a BA or MA requirement may be completed in one of the following ways:

1. Completion of 25 credits in one foreign language.

2. Completion of 30 credits in two foreign languages.

3. In general, completion of course number 202 in one of the foreign languages or an upper-division (300-level or above) foreign language grammar or literature course. Conversation classes generally cannot be considered in satisfying this requirement.

4. Successful completion of the Intensive English Language Institute (IELI) program for international students.

5. TOEFL, Michigan, or IELI placement scores high enough to meet the University admission criteria.

Graduation Requirements and General Information

American Institutions Requirement. All graduates are required to have an understanding of the fundamentals of the history, principles, form of government, and economic system of the United States. Students may meet this requirement in any one of the following ways: (a) a passing grade in a special examination; (b) a passing grade in the Advanced Placement Examination in American History; (c) the satisfactory completion of a major or minor in economics, history, political science, or American studies; (d) the satisfactory completion of one of the following courses: History 170, American Civilization (5 credits); Political Science 110, United States Government and Politics (5 credits); or Economics 200, Economics I (5 credits); (e) satisfactory completion of a 5-credit hour transfer course equivalent to one of the courses in (d).

Total Credits. A minimum of 186 credits of acceptable collegiate work and a minimum of 150 credits with a grade of *C* or better are required for graduation. (*C*- grades do not count toward this 150-credit minimum.)

Upper-Division Credit. A minimum of 60 credits of upper-division work.

General Education. Completion of the General Education requirements. (See pages 22-29.)

In Residence. Candidates for a bachelor's degree must complete at least 45 credits in residence at USU's Logan campus or designated residence centers; 15 of which must be included within the last 60 credits presented for the degree.

Upon recommendation of the department and with the concurrence of the college dean, a candidate for a degree may complete, when appropriate, the residence requirements at designated residence centers.[1]

[1]USU Residence Centers at Vernal-Roosevelt and Moab, and other centers designated by the State Board of Regents.

Independent Study Credits. The maximum amount of Correspondence (Independent Study) Credit which may be applied toward a bachelor's degree is 45 credits. Correspondence courses are not considered resident credit, nor are they accepted for graduate degrees.

Extension and Independent Study. Applicants for degrees who have taken courses for credit through extension classwork or Independent Study courses are subject to regular University admission requirements and must file transcripts of all university credit with the Office of Admissions.

Junior College Credit. No more than 120 credits of transfer credit from junior colleges will be applied toward graduation.

GPA Requirement. A 2.0 GPA is the minimum University standard students must attain in order to be considered for graduation. However, many majors and professional programs have additional GPA requirements beyond this minimum standard. USU credits only are used in computing the GPA.

Honors. To qualify for graduation honors a student must have 60 credits in residence at Utah State University. The University designated honors at graduation are:

Summa Cum Laude	3.950 to 4.000 GPA
Magna Cum Laude	3.800 to 3.949 GPA
Cum Laude	3.500 to 3.799 GPA

The above grade point averages are USU cumulative grade point averages. The grade point average from transfer credits is not taken into consideration for University honors.

Financial Obligations. Students are reminded that nonpayment of fees owed to the University may result in withholding of diplomas or certificates.

Remedial Courses. Courses numbered 0-99, which are remedial courses, will not satisfy baccalaureate requirements.

Correspondence Courses. Grades for Correspondence (Home Study) Courses must be completed and on file in the Records Office by the last day of the quarter of intended graduation.

Incomplete Grades. Incomplete grades must be made up and on file in the Records Office no later than the last day of the quarter for which the candidate is applying for graduation.

Applying for Graduation

Candidates for graduation must file an application in the Graduation Office two quarters prior to the quarter of intended graduation. The application process must be completed and fees paid by the last day of the quarter of application. Late applicants will be assessed a $10 late fee. Example: Students who intend to graduate spring quarter must accomplish the application process and fee payment by the last day of fall quarter.

Students must complete the application process by sequentially following these steps: (1) Request application in the Graduation Office, (2) carefully review instruction sheet for graduation application instructions, signatures, deadlines, etc., (3) submit application to department adviser and college dean for review and signatures, (4) pay application fee of $10 in Cashiers Office. Approximately one month is needed to complete the application process. Double majors must have the appropriate signatures for each major.

Names of the candidates will appear on the graduation lists and diplomas as they appear on the student's transcript.

Reapplication for Graduation. Students who do not successfully complete graduation requirements by the end of spring quarter must reapply for graduation for the new academic year.

Commencement

Candidates who completed requirements and received their diplomas at the end of summer, fall, or winter quarters are invited and encouraged to attend commencement exercises with the spring quarter graduates.

Attendance at Commencement is expected of all candidates. If unable to attend, the student must notify the dean of his or her college and be officially excused in advance. Also, the student must notify the Graduation Office of the address to which the diploma is to be sent. Participation in commencement exercises does not ensure that the candidate has satisfied graduation requirements.

Second Bachelor's Degree

A student who wishes to qualify for a second bachelor's degree must complete a minimum of 45 credits beyond those required for the first four-year degree, 30 of which must be taken in residence at USU's Logan campus or designated residence centers.[1] Candidates for a second bachelor's degree must file an application with the Admissions Office and obtain the recommendation of their academic dean. Candidates must also meet the requirements of the major department.

Candidates for a second bachelor's degree must have met the American Institutions requirement in the first bachelor's degree, or complete the requirement before receiving the second bachelor's degree.

Note: The first bachelor's degree must have been awarded by an accredited college or university.

Split Form

A student who is within 45 credit hours of completing a baccalaureate degree may file a Split Form showing division of classes between two undergraduate degrees, or an undergraduate and graduate degree. **These classes must be identified each quarter on a Split Form.**

For a second bachelor's degree, an application for admission to the second bachelor's degree program must be submitted to the Admissions Office. A Split Form must be obtained from the Graduation Office and be filed prior to the posting of grades for the quarter in which the request is submitted. The form must be signed by the student's adviser and college dean of both majors.

For a graduate degree, an application for admission to the Graduate School must be submitted, along with an application for graduation. The student must have a 3.0 grade point average. The Split Form must be signed by the Graduate School. The Split Form should be filed before grades are posted for the quarter in which the course was taken, but **must** be filed no later than the quarter of graduation. A maximum of 12 credits may be split out for a graduate degree.

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[1]USU Residence Centers at Vernal-Roosevelt and Moab, and other centers designated by the State Board of Regents.

Course Numbering System

USU maintains a quarterly system—four quarters or periods of classwork: fall, winter, spring, and summer. Each quarter is of 10 to 12 weeks duration. Summer quarter is eight weeks with two one-week presessions and a one-week postsession.

Credit Enrollment. The quarter hour is the unit on which credit is computed. It represents one fifty-minute class exercise per week for the duration of a quarter. To obtain credit, a student must be properly registered and pay fees for the course.

Each course listed in the catalog has a number, given immediately before the name of the course. For example in the English Department there appears:

109. Elements of Grammar.

This means the course, Elements of Grammar, is English 109. The numbers are useful for reference and records.

Course Numbering Code. A standard code employed by all institutions in the State System of Higher Education was adopted by USU in 1970, changing all previously used numbers. The present numbering system is as follows:

001-099	Remedial courses; will not satisfy baccalaureate requirements; nontransferable; not calculated in GPA.
100-279	Lower division (freshman and sophomore courses)
280-299	Lower division independent study designation (directed reading, individual projects, etc.)
300-479	Upper division (junior and senior courses)
480-499	Upper division independent study designations (directed reading, individual projects, festival, institutes, workshops, etc.)
500-599	Advanced upper division (graduate credit allowed for departmental majors or by permission of student's department chairperson)
600-799	Graduate courses (students without baccalaureate degrees must obtain special permission to enroll)
590-599	Independent study designations (directed reading,
690-699	individual projects, theses, dissertations, etc.)
790-799	
680-689	Graduate seminars (includes methodology and
780-789	research seminars)

Master's Thesis

(697)	Thesis research
(699)	Continuing graduate advisement

Doctor's Dissertation

(797)	Dissertation research
(799)	Continuing graduate advisement

"H" following regular course designation indicates Honors Program courses.

A freshman or sophomore may take any lower-division course. If there is a prerequisite for a particular course, it will be so stated in the course description.

A junior or senior may take any lower- or upper-division course. Any prerequisites to a course will be identified in the course description. Seniors may take graduate courses only upon written consent from the instructor.

A graduate student may take any course, but only graduate courses and individually approved undergraduate courses yield graduate credit.

At the end of each course description are listed the number of credits given for the course and the quarter(s) it will likely be taught. The credits and the quarter(s) it will be taught are indicated in abbreviated form in parentheses. For example: (3F) indicates that the course offers three credits and will likely be taught fall quarter. The designation (5F,W,Sp,Su) indicates that the course offers 5 credits and will likely be taught all four quarters: fall, winter, spring, and summer. It does not mean that the student has to take the class all four quarters, but rather that he or she has a choice of any quarter. In some cases, such as (5F,W,Sp), even though more than one quarter is indicated, the course will not be given each quarter, but only one of these quarters, the exact one yet to be decided.

For more definite up-to-date information, please refer to the University Schedule of Classes published prior to the beginning of each quarter. All catalog listings are subject to change. The schedule will also update policies and practices of the University as changes occur.

Occasionally two or more closely related courses will be listed under one entry, such as Chemistry **306, 307, 308. Physical Chemistry.** The credit entry will read: (3F) (3W) (3Sp). That means that each of the three courses offers 3 credits.

In some classes the amount of credit for which students register can be individually arranged. One student may take 2 credits, another student 3 credits, etc. Academic credit is identified in parentheses at the end of the course description, e.g. (1-3).

Preceding the number of some courses in this catalog will be either a single asterisk (*) or a double asterisk (**). Such courses are taught on alternate years. **Check the *Schedule of Classes* or consult the course instructor or department head.**

Course Prefixes

Acct—Accounting
ADVS—Animal, Dairy and Veterinary Sciences
Agr—College of Agriculture
AgSa—Agriculture Satellite
AI—American Institutions
Anth—Anthropology *(Sociology, Social Work and Anthropology Department)*
Arab—Arabic
Art—Art
AS—Aerospace Studies
ASTE—Agricultural Systems Technology and Education
BA—Business Administration
BIE—Biological and Irrigation Engineering
Biol—Biology
BIS—Business Information Systems and Education
Bmet—Biometeorology *(Plants, Soils, and Biometeorology Department)*
Bot—Botany *(Biology Department)*
CEE—Civil and Environmental Engineering
Chem—Chemistry and Biochemistry
Chin—Chinese
ComD—Communicative Disorders and Deaf Education
Comm—Communication *(Journalism)*
CS—Computer Science
DE—Dance Education *(Health, Physical Education and Recreation Department)*
DEP—Dance Education—Professional *(Health, Physical Education and Recreation Department)*
ECE—Electrical and Computer Engineering
Econ—Economics
Educ—College of Education
ElEd—Elementary Education
Engl—English
Engr—General Engineering
Ent—Entomology *(Biology Department)*
FHD—Family and Human Development
FL—College of Family Life
FR—Forest Resources
Fren—French
FW—Fisheries and Wildlife
Geog—Geography *(Geography and Earth Resources Department)*
Geol—Geology
Ger—German
Grk—Greek
HASS—College of Humanities, Arts and Social Sciences
HEnv—Human Environments
HEP—Health Education—Professional *(Health, Physical Education and Recreation Department)*
Hind—Hindi
Hist—History
Honr—Honors Courses
HU—Humanities and Arts
IELI—Intensive English Language Institute
InsT—Instructional Technology
IO—Integrative Option
Ital—Italian
ITE—Industrial Technology and Education
Japn—Japanese
Kor—Korean
LAEP—Landscape Architecture and Environmental Planning
Lang—Languages (General)
LAS—Liberal Arts and Sciences
Latn—Latin
Ling—Linguistics
LS—Life Science
MAE—Mechanical and Aerospace Engineering
Math—Mathematics *(Mathematics and Statistics Department)*
MHR—Management and Human Resources
Micb—Microbiology *(Biology Department)*
MS—Military Science
Musc—Music
NFS—Nutrition and Food Sciences
NR—Natural Resources
PE—Physical Education *(Health, Physical Education and Recreation Department)*
PEP—Physical Education—Professional *(Health, Physical Education and Recreation Department)*
Phil—Philosophy *(Languages and Philosophy Department)*
Phyl—Physiology *(Biology Department)*
Phyx—Physics
PlSc—Plant Science *(Plants, Soils, and Biometeorology Department)*
PolS—Political Science
Port—Portuguese
PRP—Parks and Recreation—Professional *(Health, Physical Education and Recreation Department)*
PS—Physical Science
PSB—Plants, Soils, and Biometeorology
Psy—Psychology
PubH—Public Health *(Biology Department)*
RE—Recreation Courses *(Health, Physical Education and Recreation Department)*
RLR—Rangeland Resources
RR—Recreation Resources *(Forest Resources Department)*
Russ—Russian
ScEd—Secondary Education
Sci—College of Science
SK—Learning Skills
Soc—Sociology *(Sociology, Social Work and Anthropology Department)*
Span—Spanish
SpEd—Special Education and Rehabilitation
Soil—Soil Science *(Plants, Soils, and Biometeorology Department)*
Spch—Speech *(Languages and Philosophy Department)*
SS—Social Science
Stat—Statistics *(Mathematics and Statistics Department)*
SW—Social Work *(Sociology, Social Work and Anthropology Department)*
Thea—Theatre Arts
Urdu—Urdu
WC—Written Communication
WS—Watershed Science
Zool—Zoology *(Biology Department)*

University Smoking Policy

Utah State University conforms to the provisions of the 1992 Utah House Bill No. 197—Clean Air in Government Buildings, Utah Code Section 76-10-106. The provisions of this bill include the following: (a) A person may not smoke in a building, or portion of a building, that is owned, leased, or occupied by the state or any state agency; (b) Designated smoking areas in buildings are prohibited under this subsection; and (c) This subsection takes precedence over any conflicting provision of this section.

It is the responsibility of all University staff and students to adhere to this policy and to appropriately inform campus visitors of its provisions. Deans, department heads, and other supervisory personnel are responsible for the enforcement of the policy.

USU Written Communication and General Education Requirements

(46 Credits Minimum)

Specific Written Communication and General Education Requirements vary according to the students' Major. Each student is responsible to check the requirements for their Major. Students should make early contact with their Academic Adviser and understand the information in the Undergraduate Catalog and on their Major Requirement Sheet.

The purpose of the University is to help students acquire knowledge, skills, and attitudes that prepare them for a full life and a useful career.

Courses required for a Major program of study prepare students to be successful in their chosen profession.

The General Education Requirements help students expand their awareness of life and the world they live in by strengthening their learning skills, broadening their knowledge, and by helping them to integrate knowledge from different subject areas and gain a better understanding of cultural traditions.

Additional courses may be approved on a continuing basis by the General Education Subcommittee of the Educational Policies Committee. An updated list of courses approved for General Education will appear in the quarter *Schedule of Classes*.

Written Communication Requirement (WC) 6 credits (minimum) from the list below

All students must successfully complete a minimum of 6 credits of Written English Composition. At least 3 of these credits must be in 200 level courses (above freshman level) or in higher level approved courses if the student has had the appropriate prerequisites. This minimum 6 credit requirement may be met by completing English courses from the Written Communication (English Composition) list below. Part of this requirement may be filled by examinations given in accordance with policies developed by the Board of Regents and the USU Department of English. See **Credit by Examination** on page 28. The CLEP or AP Tests may be used to fill 3 credits of this requirement at the 100 freshman level.

(Colleges and Departments may require more than 6 credits of English and may require specific additional courses to complete this requirement. See Major Requirement Sheet and adviser for specific courses allowed.)

Written Communication (English Composition) Courses (WC)

(See Major Requirement Sheet to find out which of these courses are required for your Major.)

Engl WC 101	English Composition (3)
Engl WC 105	Vocational English (3)
Engl WC 111	Strategies of Writing (3)
Engl WC 200	Persuasive Writing (3)
Engl WC 201	Research Writing (3)
Honr WC 204	Writing Seminar (3)

General Education Requirements (40 credits)

Learning Skills Requirement (SK) 10 Credits

Ten total credits including:

a. At least one course from Group I, and
b. Courses from at least 2 of the 6 subject areas listed below in Groups I and II.

Note: Colleges and Departments may require specific courses in this area. See your Major Requirement Sheet and Academic Adviser.

Learning Skills Courses (SK)

Group I—Students must take at least one course from this group in Math or Computer Literacy or Deductive Logic.

Subject Areas: (1-Math, 2-Computer Literacy, 3-Deductive Logic)

1. **Mathematics**
   Math SK 101 Intermediate Algebra (5)
   Or any higher-level math course requiring Math SK 101 as a prerequisite, including Math SK 201 and SK 202, and Stat SK 201.

2. **Computer Literacy**

CS SK 150	BASIC Programming (4)
CS SK 160	Elementary Computer Science, Alogorithms, and Problem Solving (4)
CS SK 170	Computer Science I (4)
CS SK 171	Computer Science II (3)
CS SK 172	Computer Science III (3)
CS SK 241	FORTRAN Programming (3)
CS SK 251	COBOL Programming (3)
BIS SK 140	Microcomputer Applications in Business (3)

3. **Deductive Logic**
   Phil SK 210 Deductive Logic (5)

Group II—Learning Skills Courses

The remainder of the 10 credits in Learning Skills may be taken in Group I or in Group II, however, the 10 credits must include courses from 2 of the 6 subject areas.

Subject Areas: (4-Foreign Languages, 5-Library Information Retrieval, 6-American Sign Language)

4. **Foreign Languages**—101 or higher level

5. **Library Information Retrieval**
   InsT SK 100 Use of Libraries and Learning Resources (3)
   Honr SK 100H Library Literacy (2)
6. **American Sign Language**
   ComD SK 338 Sign Language I (3)
   (338H)

Broadening Knowledge Requirement

All students must complete one of the two options shown below. Students should check their Major Requirement Sheet and contact their Academic Adviser, Department, College, or University Academic Service Center to determine which option they should complete for their Major.

Option I—Standard Program (30 credits)

This option is required by some Majors at USU.

(Courses in the Major subject cannot be used to fill Broadening Knowledge Requirements.)

The courses in the Broadening Knowledge Requirement are divided into 4 Major Areas plus an Integrative Option Area. These 5 areas are:

1. **Humanities and Arts (HU):** Where aesthetic need, creative powers, and distinctive human talents are explored;
2. **Social Sciences (SS):** Which examines the behavior, institutions, and social structures of human beings;
3. **Life Sciences (LS).** Which explores the organization and vital functions of living organisms;
4. **Physical Sciences (PS).** Which emphasizes nature and workings of the universe;
5. **Integrative Knowledge Option (IO).** Courses which focus on the integration of knowledge from at least two of the four areas listed above.

The **30 credits** required for the Broadening Knowledge Option I Requirement are **distributed across** the **5 areas of Humanities and Arts (HU), Social Sciences (SS), Life Sciences (LS), Physical Sciences (PS), and Integrative Option (IO).** Students should make sure they complete the number of credits required by their Major Area from approved lists in Humanities and Arts (HU), Social Sciences (SS), Life Sciences (LS), Physical Sciences (PS), and Integrative Option (IO) (see approved lists on pages 24-26). Students should check their Major Requirement Sheet for specific requirements and consult with their Academic Adviser in their Department. Engineering students should see pages 28-29 for their General Education requirements.

Example: A student Majoring in the **Social Sciences (SS)** Area has a different distribution of credits than a student Majoring in the **Physical Sciences (PS)** Area.

All Academic Majors are located in one of the following four Broadening Knowledge Areas: **Humanities and Arts (HU), Social Sciences (SS), Life Sciences (LS),** or **Physical Sciences (PS).** The Broadening Knowledge Requirement Option I credit distribution is different for each of the 4 Major Areas (see credit distribution tables 1 and 2 on page 24).

Option II—Liberal Arts and Sciences (LAS) Area Studies Certificate
(46 credits minimum)

This option is required or highly recommended by many majors and may be used for any major if approved by the major college and department. It offers students the systematic exposure to writing, thinking, interdisciplinary breadth, and indepth study that even the most technical jobs of the twenty-first century will demand.

Students taking this option must complete all the following requirements:

A. A minimum of 46 total credits, as shown in requirements B and C.
B. LAS IO 125 (Pathways to Knowledge) 3 credits. This is the Liberal Arts and Sciences Program (LAS) orientation course.
C. Complete two of the following LAS course clusters for a total of 43 credits minimum. (See approved cluster course lists and requirements on pages 26-27.)
   1. Beauty Cluster (20 credits)
   2. Civilization Cluster (27 credits)
   3. Science and Society Cluster (25 credits)
   4. Future Environments Cluster (27 credits)
   5. Matter and Spirit Cluster (23 credits)
   6. Any additional LAS cluster approved by the University.

At graduation, students who have completed these Broadening Knowledge Option II LAS requirements will receive an area studies certificate. Students can obtain detailed requirements and advisement about this option from the Science/HASS Advising Center, Student Center 304, 797-3883, or by writing to Liberal Arts and Sciences, Utah State University, Logan, UT 84322-0107.

Information and requirements are also available in the University Academic Service Center, Student Center 302. Students should see their assigned Academic Adviser concerning overall program planning for their major.

List of Undergraduate Majors

(The following list shows each Major and its Broadening Knowledge classification by Major Area, i.e. Humanities and Arts (**HU**) or Social Sciences (**SS**) or Life Sciences (**LS**) or Physical Sciences (**PS**).

College of Agriculture

1. International Agriculture:
   a. Options in Animal, Dairy and Veterinary Sciences, Plant Science, Agricultural Education, **LS**
   b. Options in Soil Science, **PS**
   c. Options in Agricultural Economics, **SS**
2. Agricultural Education (all options), **LS**
3. Agricultural Systems Technology, **LS**
4. Animal, Dairy and Veterinary Sciences (all majors and options), **LS**
5. Economics and Agricultural Economics (all majors and options), **SS**
6. Nutrition and Food Sciences (all majors and options), **LS**
7. Plants, Soils, and Biometeorology (all majors and major options), **LS**

College of Business

All majors and major options, **SS**

College of Education

1. Communicative Disorders (all options), **SS**
2. Elementary Education (increased requirements meet requirements for the four major areas, **LS, PS, SS, HU**)
3. HPER:
   a. Health Education Specialist major, **LS**
   b. All other majors, **SS**
4. Instructional Technology (no BS degree programs)
5. Psychology (all major options), **SS**
6. Secondary Education (Note: All majors are associated with a program outside the department and will follow the major area of the other department.)
7. Special Education (all major options), **SS**

College of Engineering
All majors and major options, **PS**

College of Family Life
1. Family and Human Development (all major options), **SS**
2. General Family Life (all major options), **SS**
3. Human Environments:
   a. Apparel Merchandising major, **SS**
   b. Interior Design major, **HU**
   c. All other major options, **SS**
4. Nutrition and Food Sciences (all majors and major options), **LS**

College of Humanities, Arts and Social Sciences
1. Aerospace Studies (no degree)
2. Art (all major options), **HU**
3. Communication (all majors and major options), **SS**
4. English:
   a. Standard English major and options, **HU**
   b. English teaching major and options, **HU**
   c. American Studies:
      i. Social Science concentration, **SS**
      ii. Literature, **HU**
5. History (all majors and major options), **SS**
6. Landscape Architecture and Environmental Planning (all majors and major options), **HU**
7. Languages and Philosophy (all majors and major options), HU
8. Military Science (no degree)
9. Liberal Arts and Sciences, **HU**
10. Music (all majors and major options), **HU**
11. Political Science (all majors and major options), **SS**
12. Sociology, Social Work and Anthropology (all majors and major options), **SS**
13. Theatre Arts (all majors and major options), **HU**

College of Natural Resources
All majors and major options satisfy the LS requirement except Geography, **SS**, and Watershed Science, **PS**.

College of Science
1. Biology (all majors and major options), **LS**
2. Chemistry and Biochemistry (all majors and major options), **PS**
3. Computer Science (all major options), **PS**
4. Geology (all majors and major options), **PS**
5. Mathematics and Statistics (all majors and major options), **PS**
6. Physics (all majors and major options), **PS**

Honors Program (no degrees offered)

Broadening Knowledge Requirement Option I (30 credits minimum)

(Courses in the Major subject cannot be used to fill Broadening Knowledge Option I Requirements.)

Specific Credit Requirements by Major Areas

Table 1 and Table 2 below show how General Education Broadening Knowledge credits are distributed for each of the four Major Areas. Distribution of credits in the Broadening Knowledge Requirement is designed to provide students with a more balanced education. Students with Majors in the related areas of Humanities and Arts, and Social Sciences, are required to complete more credits in the Sciences (Life Sciences and Physical Sciences). Students with Majors in the Sciences (Life Sciences and Physical Sciences) are required to complete more credits in the Humanities and Arts, and Social Sciences.

Students in the Colleges of Agriculture, Business, Education, Family Life, Natural Resources, and Science should use Broadening Knowledge Requirement Credit Distribution Table 1.

Students in the College of Humanities, Arts and Social Sciences use Broadening Knowledge Requirement Credit Distribution Table 2.

Students in the College of Engineering follow the College of Engineering General Education Requirements shown on pages 28-29.

Colleges of Agriculture, Business, Education, Family Life, Natural Resources, and Science

Broadening Knowledge Requirement Credit Distribution Table 1.

Broadening Knowledge Requirement Areas

30 Credits Required

Major Areas	HU	SS	LS	PS	IO	Total Credits
Human. & Arts (HU)	0-5*	0-6	5-16	5-16	0-9	30
Social Sc. (SS)	0-6	0-5*	5-16	5-16	0-9	30
Life Sc. (LS)	5-16	5-16	0-5*	0-6	0-9	30
Phys. Sc. (PS)	5-16	5-16	0-6	0-5*	0-9	30

*Outside courses taught by the Major.

College of Humanities, Arts and Social Sciences

Broadening Knowledge Requirement Credit Distribution Table 2.

Broadening Knowledge Requirement Areas

30 Credits Required

Major Areas	HU	SS	LS	PS	IO	Total Credits
Human. & Arts (HU)	5*	6	5-14	5-14	0-9	30
Social Sc. (SS)	6	5*	5-14	5-14	0-9	30

*Outside courses taught by the Major.

Approved Broadening Knowledge Courses

Humanities and Arts Courses (HU) Approved List (see Major Requirement Sheet and Academic Adviser for any specific courses that may be required).

1. ComD HU 270	Language, Hearing, and Speech Development (5)
2. HEnv HU 105	Design in Everyday Living (3) (or Art 101)
3. Art HU 101 (or HEnv 105)	Exploring Art (3)
4. Art HU 275	Survey of Western Art (3)
5. Art HU 276	Survey of Western Art (3)

6. Art HU 277	Survey of Western Art (3)
7. Engl HU 113	Great Literature of Europe (3)
8. Engl HU 114	Great Literature of Britain (3)
9. Engl HU 115	Great Literature of America (3)
10. Engl HU 120	Great Books and Ideas (3)
11. Engl HU 121	Great Books and Ideas (3)
12. Engl HU 122	Great Books and Ideas (3)
13. Engl (Hist) HU 124	Introduction to Folklore (3)
14. Engl HU 126	Mythology (3)
15. Engl HU 311	Classical Mythology in Western Art (3)
16. Hist HU 201	Thinking Historically: Regions and Times (5)
17. LAEP HU 103	Introduction to Landscape Architecture (3)
18. Phil HU 101	Introduction to Problems of Philosophy (5)
19. Phil HU 111	Ethics (4)
20. Phil HU 215	Aesthestics (3)
21. Phil (LAS) HU 337	Mind Sets (3)
22. Musc HU 101	Enjoying Music (3)
23. Musc HU 102	Fundamentals of Music (3)
24. Musc HU 201	Masterpieces of Music (3)
25. Musc HU 300	History of Jazz and Popular Music (3)
26. Thea HU 101	Understanding Theatre (5)
27. Thea HU 140	Exploring Performance Through Literature (5)
28. Thea HU 201	Understanding Movies (3)
29. Honr HU 240	Arts in Interesting Times (3)

Social Sciences Courses (SS) Approved List (see Major Requirement Sheet and Academic Adviser for any specific courses that may be required).

1. Econ AI 200	Economics I (5)
2. Econ SS 201	Introduction to Microeconomics (3)
3. BA SS 135	Introduction to Business (3)
4. BIS SS 314	Managing Personal Finances (3) (or HEnv 255, or HEnv 355)
5. MHR SS 311	Managing Organizations and People (4)
6. Psy SS 101	General Psychology (5)
7. Psy SS 110	Human Development: General (3-5) (or FHD SS 150)
8. Psy SS 121	Psychology of Human Adjustment (3)
9. Psy SS 140	Analysis of Behavior: Basic Principles (4)
10. FHD SS 120	Marriage and the American Family (3)
11. FHD SS 150	Human Growth and Development (5) (or Psy SS 110)
12. FHD SS 304	Human Sexuality and Family Relations (3)
13. HEnv SS 355 or HEnv SS 255	Family Finance (3) The Consumer and the Market (3) (or BIS SS 314)
14. Comm SS 121	Introduction to Mass Communications (4)
15. Hist SS 104	Western Civilizations: Ancient and Medieval (5)
16. Hist SS 105	Western Civilization: Modern (5)
17. Hist AI 170	American Civilization (5)
18. Spch SS 260	Interpersonal Communication (3)
19. PolS SS 101	Government and the Individual (4)
20. PolS AI 110	United States Government and Politics (5)
21. PolS SS 210	Introduction to International Politics (5)
22. PolS SS 220	Comparative Politics (5)
23. Soc SS 101	Introductory Sociology (5)
24. Soc (Anth) SS 102	American Culture (3)
25. Soc SS 140	Modern Social Problems (3) (or SW SS 105)
26. Anth SS 101	Introduction to Anthropology (5)
27. Anth SS 110	Human Origins (5)
28. Anth SS 150	Peoples and Cultures of the World (5)
29. SW SS 105	Introduction to Social Welfare (3) (or Soc SS 140)
30. Geog SS 101	Human Geography (5)
31. Geog SS 103	World Regional Geography (5)

Life Sciences Courses (LS) Approved List (see Major Requirement Sheet and Academic Adviser for any specific courses that may be required).

1. ADVS LS 120	Anatomy and Physiology of Animals (5)
2. NFS LS 122	Nutrition for People (3)
3. PlSc LS 100	Introduction to Agricultural Plant Science (4)
4. FW LS 280	Conservation Biology (3)
5. FW (RLR) LS 284	General Ecology (5)
6. Biol LS 101	Biology and the Citizen (5)
7. Biol LS 102	Biology and the Citizen Laboratory (1)
8. Biol LS 105	Discovering Nature (2)
9. Biol LS 106	Discovering Nature (2)
10. Biol LS 125	General Biology I (5)
11. Biol LS 257	Evolution (3)
12. Micb LS 111	Elementary Microbiology (4)
13. Micb LS 112	Elementary Microbiology Laboratory (1)
14. Ent LS 229	Insect Biology (3)
15. Phyl LS 103 or Phyl LS 130	Human Anatomy (5) Human Physiology (5)

Physical Sciences Courses (PS) Approved List (see Major Requirement Sheet and Academic Adviser for any specific courses that may be required).

1. Bmet PS 200	Introduction to Weather (3)
2. Bmet (Geog) PS 382	Regional Climatology (3)
3. Soil PS 200	Soils, Waters, and the Environment: An Introduction (3)
4. Engr PS 101	Introduction to Engineering (2)
5. Geog PS 113	Physical Geography (5)
6. CS PS 101	Computers and Their Uses (4)
7. Chemistry—one of:	
Chem PS 101	Introduction to Chemistry (5)
Chem PS 111	General Chemistry (5)
Chem PS 121	Principles of Chemistry (5)
8. Chem PS 122	Principles of Chemistry (4)
9. Chem PS 124	Chemical Principles Laboratory (1)
10. Chem PS 141	Elementary Organic Chemistry (4)
11. Chem PS 142	Molecules and Life (4)
12. Chem PS 144	General Chemistry Laboratory (2)
13. Geology—one of:	
Geol PS 101	Introductory Geology (5)
Geol PS 105	Environmental Geology (5)
Geol PS 111	Physical Geology (5)
14. Geol PS 200	Earth History (4)
15. Physics—one of:	
Phyx PS 100	The Solar System (3)
Phyx PS 108	Stars and Galaxies (3)
Phyx PS 200	Astronomy (3)
16. Physics—One of:	
Phyx PS 101	Introductory Physics (5)
Phyx PS 111	General Physics (5)
Phyx PS 112	General Physics (5)
Phyx PS 113	General Physics (5)
Phyx PS 120	General Physics Survey (5)
Phyx PS 221	General Physics—Science (5)
Phyx PS 222	General Physics—Science (5)
Phyx PS 223	General Physics—Science (5)

Integrative Option Courses (IO) Approved List (0-9 credits).

Up to 9 credits may be selected from the following list. A student may not use more than one Integrative Option course taught by a department in the same major area as that of the student's Major. (See Major Requirement Sheet and Adviser for any specific courses that may be required.)

1. ADVS IO 130	Domestic Animals and Mankind (5)
2. ADVS IO 330	Animal Production and Public Policy (3)
3. NFS IO 101	Food Fascinations and Fallacy (3)
4. Soil IO 400	Soil and Water Conservation (5)
5. BIS IO 305	Information Technology and the Future (3)
6. BIS IO 306	The World of Systems (3)
7. HEP IO 250	Health and Wellness (2)
8. Engr IO 320	Technology and Human Values (3)
9. ECE (Phyx) IO 260	Science of Sound (5)
10. HEnv (Soc) IO 238	Gender Roles in American Society (3)
11. Engl (Hist) (Anth) IO 526	Legends, Myths, and Folktales (3)

12. Hist (FW) IO 395	Environmental History (3)
13. Ling (Anth) IO 340	An Introduction to Linguistics (5)
14. Anth IO 210	Perspectives on Race (3)
15. Anth IO 231	Introduction to Archaeology (5)
16. LAS IO 125	Pathways to Knowledge (3)
17. LAS IO 325	World of Tomorrow (3)
18. RR IO 250	Wilderness in America (3)
19. NR IO 101	Natural Resources and the Future (3)
20. NR (Geog) IO 511	Environmental Education (4)
21. FW IO 250	World Wildlife (3)
22. FW IO 260	Oceanography (4)
23. Geog IO 171	Human Impact on Environment (5)
24. Biol IO 205	Plants and Civilization (3)
25. Biol IO 308	Evolution and Environmental Issues (4)
26. Biol IO 310	Bioethics (3)
27. Biol IO 533	History of Biology (3)
28. Phyl IO 135	Brain and Behavior (5)
29. Phyx (MAE) IO 216	Energy (3)
30. Phyx IO 318	Intelligent Life in the Universe (3)
31. Honr IO 104	Orientation to the Honors Program (1)
32. Honr IO 390	Independent Study (1-5)

Additional courses, offered under the designation of *University Studies*, can be used to meet requirements for Broadening Knowledge Requirement Option I. (See the University Studies section on page 28.)

Broadening Knowledge Requirement Option II (46 credits minimum)

To complete Option II, students must obtain the Liberal Arts and Sciences (LAS) Area Studies Certificate. This route through the *Broadening Knowledge* portion of General Education requires the LASP orientation course, LAS 125, as well as two LAS clusters. The minimum number of credits required is 46. A minimum 2.5 GPA must be maintained in the certificate courses. Upon graduation, students completing the Liberal Arts and Sciences certificate will receive notation of its completion on their transcripts. Students who wish to get the LAS Certificate must have a 2.5 GPA in LAS Certificate courses and must apply for the Liberal Arts and Sciences Certificate in the Science/HASS Advisement Center in Student Center 304.

Approved Courses for LAS Certificate

LAS IO 125 **Pathways to Knowledge (Required) (3)**

Two of the following clusters must be completed. A **maximum** of five Advanced Placement credits per cluster are permitted in appropriate substitutions. Up to five credits can be duplicated in two clusters.

Beauty Cluster. A minimum of 20 credit hours must be completed. Students must complete credits from each of the five areas below, as described:

A. Phil HU 215 **Aesthetics (3)**

B. Beauty in Art

Select at least one course:

Engl 116	Understanding Literature (3)
Engl 556	Topics in American Literature: American Nature Writers (3)
Thea HU 201	Understanding Movies (3)
Musc 450	Proseminar in Music History (3)
Art HU 101	Exploring Art (3)
LAEP HU 103	Introduction to Landscape Architecture (3)

C. Beauty in Science

Select at least two courses and a minimum of five credits:

Biol LS 105	Disco
Biol LS 106	Discovering Nature (2)
Geol PS 101	Introductory Geology (5)
Phyx PS 100	The Solar System (3)
Phyx PS 108	Stars and Galaxies (3)
Phyx PS 200	Astronomy (3)
Phyx IO 318	Intelligent Life in the Universe (3)

D. Creative Experiences

Select at least two courses and a minimum of four credits:

Engl 302	Fiction Writing (3)
Engl 306	Poetry Writing (3)
Art 102	Two-dimensional Design (3)
DE 170	Introduction to Modern Dance (1)
DE 181	Beginning Ballet (1)
Thea HU 140	Exploring Performance through Literature (5)
Musc 518	Composition and Analysis (3)
LAEP 135	Theory of Design (4)

E. Capstone Courses. Both courses must be completed following completion of sections *A*, *B*, *C*, and *D* above.

Anth 401	Comparative Aesthetics (3)
HASS 525	Workshop: Perspective on Beauty (2)

Civilization Cluster. A minimum of 27 credit hours must be completed. Students must take classes in each of the six areas as described below:

A. Select at least two courses:

Hist SS 104	Western Civilizations: Ancient and Medieval (5)
Hist SS 105	Western Civilization: Modern (5)
Phil HU 101	Introduction to Problems of Philosophy (5)

B. Select at least one course:

Engl HU 113	Great Literature of Europe (3)
Engl HU 114	Great Literature of Britain (3)
Engl HU 120, 121, or 122	Great Books and Ideas (3)
Art HU 275, 276, or 277	Survey of Western Art (3)
Thea 205	Introduction to Theatre Studies II (3)

C. Select at least one course:

Biol IO 205	Plants and Civilization (3)
Anth SS 150	Peoples and Cultures of the World (5)

D. Select at least one course:

Biol LS 101	Biology and the Citizen (5) (and Biol LS 102)
Biol LS 102	Biology and the Citizen Laboratory (1)
Chem PS 101	Introduction to Chemistry (5)
Phyx PS 120	General Physics Survey (5)

E. Select at least one course:

Phil 310	History of Ancient Philosophy (4)
Phil 311	History of Medieval Philosophy (4)
Phil 312	Seventeenth Century Philosophy (3)
Phil 315	Twentieth Century Philosophy (3)
Phil 316	Nineteeth Century Philosophy (3)
Engl 330	Women in Literature (3)
Engl 425	The Bible as Literature (3)
Engl 428	Greek Literature (3)
Engl 429	Roman Literature (3)
Hist 304	Greek History (5)
Hist 306	Roman History (5)
Hist 311	Medieval Europe (A.D. 500-1500) (3)
Hist 321	Renaissance and Reformation (A.D. 1250-1600) (5)
Hist 322	Old Regime and French Revolution (4)
Hist 325	The Century of European Revolution: 1815-1917 (3)
Hist 327	The Century of Total War: 1914-Present (3)
Thea 430	History of the Theatre I (3)
Thea 432	History of the Theatre II (3)
Musc 450	Proseminar in Music History (3) (Cannot count if taken as capstone course)

F. Capstone Course

Select at least one course upon completion of sections *A, B, C, D,* and *E* above:

Musc 450	Proseminar in Music History (Beethoven and Age of Revolution) (3)
Hist 309	History of Christianity (3)
PolS 433	History of Political Thought II (4)

An Honors option may be taken as an alternative to the civilization track described here. For details, contact Daniel McInerney, Director of the Honors Program (Library 374, 797-2715.)

Science and Society Cluster. A minimum of 25 credit hours must be completed. Students must complete classes from all five areas as indicated, with at least three credits in each section.

A. Each student must complete:

Sci 150	Science Orientation (1)
Any introductory statistics course: Stat 201, Stat 230, Psy 380, Soc 312, etc.	

B. Physical Sciences. Select at least one course:

Chem PS 101	Introduction to Chemistry (5)
(May substitute the series Chem 121 through 123)	
Phyx PS 120	General Physics Survey (w/lab) (5)
(May substitute the series Phyx 221-223 or Phyx 111-113)	
Geol PS 101	Introductory Geology (5)
(May substitute Geol PS 111 and Geol PS 200)	

C. Life Sciences. Students must complete:

Biol LS 101	Biology and the Citizen (5)
Biol LS 102	Biology and the Citizen Laboratory (1)
(May substitute the series Biol 125-127)	

D. Social Sciences. Select at least one course:

Econ AI 200	Economics I (5)
PolS SS 101	Government and the Individual (4)
Soc SS 101	Introductory Sociology (5)
Anth SS 101	Introduction to Anthropology (5)
Anth SS 110	Human Origins (5)

E. Integration of Knowledge. On completion of sections *A, B,* and *C,* select at least one course:

Phyx IO 216	Energy (3)
Biol IO 308	Evolution and Environmental Issues (4)
Biol IO 310	Bioethics (3)
Soc 333	Medical Sociology (3)
Soc 462	Sociology of Natural Resources (3)
Phil 325	Medical Ethics (3)
Phil 327	Environmental Ethics (3)
Phil 490	Philosophy of Science (3)
Chem PS 142	Molecules and Life (4)
PolS 418	Natural Resources and Environmental Policy (4)

F. Capstone Course. After finishing sections *A-E*, students must complete:

Sci 430	Science in Society (3)

Future Environments Cluster. Each student must complete a minimum of 27 credits as described below:

A. The Environment

1. Required:

Biol 386	General Ecology for Life Science Majors (4)

2. Must take one of the following courses:

Geol PS 105	Environmental Geology (5)
Soil PS 200	Soils, Waters, and the Environment (3)
FW IO 250	World Wildlife (3)
Biol LS 101	Biology and the Citizen (5) **and**
Biol LS 102	Biology and the Citizen Laboratory (1)
(May substitute the series Biol 125-127)	
FW IO 260	Oceanography (4)

B. Environmental Values

1. Required:

Phil HU 111	Ethics (4)

2. Must take one of the following courses:

Phil 327	Environmental Ethics (3)
Anth 305	Anthropology and Religion (3)
Ling 390	Analysis of Cross-cultural Difference (3)

C. Past and Present Environments. Must take two of the following courses:

Soc 361	Human Ecology (3)
LAEP 231	History of Landscape Architecture (3)
Hist IO 395	Environmental History (3)
Geog SS 103	World Regional Geography (5)
PolS 310	Global Interdependence (3)
Engl 556	Topics in American Literature: American Nature Writers (3)

D. Future Environments. Must take one of the following courses:

PolS 410	Politics and Public Policy (4)
PolS 418	Natural Resources and Environmental Policy (4)
FW 401	Fisheries and Wildlife Policy and Administration (3)

E. Capstone Studio. Must complete sections *A, B, C,* and *D* before registering for capstone course.

LAEP 400	Future Environments (4)

Matter and Spirit Cluster. A minimum of 23 credit hours must be completed. Students must complete credits from each of the seven areas below, as described:

A. Biological Sciences. Must take one of the following courses:

Phyl LS 130	Human Physiology (5)
Phyl IO 135	Brain and Behavior (5)
Anth SS 110	Human Origins (5)

B. Physical Sciences. Must take one of the following courses:

Chem PS 142	Molecules and Life (4)
Phyx IO 318	Intelligent Life in the Universe (3)

C. Social and Cultural Dimensions. Must take one of the following courses:

Anth 305	Anthropology and Religion (3)
Soc 433	Religion and Society (3)
Engl/Hist 372	Folklore Colloquium (3)

D. Historical Dimensions. Must take one of the following courses:

Hist 309	History of Christianity (3)
Hist 464	American Religious History (3)
Engl 425	Bible as Literature (3)
Phil/Hist 308	History and Thought of the New Testament (3)

E. Aesthetic Dimensions. Must take one of the following courses:

Art HU 101	Exploring Art (3)
Art HU 275, 276, 277	Survey of Western Art (3)
Musc HU 101	Enjoying Music (3)
Thea HU 101	Understanding Theatre (5)
Thea 430	History of the Theatre I (3)
Thea 432	History of the Theatre II (3)

F. Philosophical Dimensions. Must take one of the following courses:

Phil 350	Philosophy of Religion (3)
Phil 431	Concept of Mind (3)
Phil 488	ST: Philosophical Theology After Kant (3)
Phil 488	ST: Oriental Philosophy (3)

G. Capstone Course. After finishing sections *A-F*, students must complete:

Phil HU 337	Mind Sets (3)

University Studies

Director: Craig Petersen
Office in Merrill Library 109, 797-1170

The following courses are offered under the designation of *University Studies*. They are taught in small sections, by outstanding faculty, and can be used to meet USU's General Education requirements as shown below. None of these courses have prerequisites.

University Studies Courses

IO 100. Introduction to University Inquiry. A small group experience in which students focus on a specific topic. The topics for each quarter are listed in the *Schedule of Classes* for that quarter. Counts as a General Education Integrative Option course. (3)

SS 130. U.S. Institutions. Provides a basic understanding of the history, principles, form of government, and economic system of the United States. Counts as a General Education Social Sciences *and* American Institutions course. (5)

PS 200. Integrated Science. Focus is on basic scientific concepts and the methods of inquiry used by scientists. Considers science from a broad perspective, showing how various disciplines are related. Counts as a General Education Physical Sciences *or* Life Sciences course. (5)

HU 201. Civilization: Humanities. Provides a basic understanding of a broad range of themes that cut across human history and continue to be important in contemporary society. Covers both Western and non-Western Civilization. Counts as a General Education Humanities course. (5)

HU 202. Civilization: Creative Arts. Students explore questions such as: What is art, and how do you judge it? How does artistic expression vary across cultures? The course covers several forms of art, and students attend concerts, visit galleries, and attend theatrical performances. Counts as a General Education Humanities course. (4)

SS 203. Social Systems and Issues. Considers how a society of self-interested individuals can live together in peace and harmony. Topic explored from the perspective of different disciplines. Counts as a General Education Social Sciences course. (3)

American Institutions Requirement

All graduates are required to have an understanding of the fundamentals of the history, principles, form of government, and economic system of the United States. Students may meet this requirement in any one of the following ways: (a) a passing grade on a special examination; (b) a passing grade on the Advanced Placement Examination in American History; (c) the satisfactory completion of a major or minor in economics, history, political science, or American studies; (d) the satisfactory completion of one of the following courses:

Econ AI 200	**Economics I (5)**
or	
Hist AI 170	**American Civilization (5)**
or	
PolS AI 110	**United States Government and Politics (5);**

(e) satisfactory completion of a 5-credit-hour transfer course equivalent to one of the courses in (d).

Credit by Examination

Students may apply CLEP, Advanced Placement, and other approved examination credit toward the undergraduate degree in accordance with state Board of Regents' policy. It is possible for all General Education coursework (including part of the Written Communication Requirement and all of the American Institutions requirement) to be fulfilled by examinations.

Students Transferring to Utah State University

If in compliance with current articulation agreements, General Education courses completed at any accredited institution of higher education in the state of Utah will fill General Education requirements, including Communication Skills. Where the designations are appropriate, courses are identified with the following prefixes: **SS, Social Sciences; LS, Life (Biological) Sciences; PS, Physical Sciences; HU, Humanities.**

Students with Associate of Science and Associate of Arts degrees from Utah Institutions are assumed to have completed the General Education requirements. See page 10 for Credit Transfer Policy of Utah System of Higher Education.

College of Engineering

Written Communication and General Education Requirements for Engineering Majors (BS Degrees) (40 credits, plus a minimum of 6 credits in Written Communication)

(Students in all Majors in the Department of Industrial Technology and Education complete the standard University General Education Broadening Knowledge Requirements for Majors in the Physical Sciences Area of Broadening Knowledge Requirement Credit Distribution Table 1, on page 24 of this catalog. See Major Requirement Sheet and Academic Adviser.)

Note: Students in the College of Engineering must satisfy Utah State University Written Communication and General Education requirements as well as the College of Engineering breadth and depth requirements described below. Students should carefully plan their General Education Program to ensure meeting both sets of requirements.

The Written Communication and General Education requirements for Engineering Majors in the College of Engineering are somewhat more restrictive than the general education program for the University due to accreditation standards imposed by ABET (Accreditation Board for Engineering and Technology). Students who complete the engineering program also satisfy University Written Communication and General Education requirements.

College of Engineering Written Communication Requirements (6 credits)

The Written Communication requirement is satisfied by completion of English 101 (English Composition) or English 111 (Strategies of Writing); and English 201 (Research Writing) or Honor 204 (Writing Seminar). Advanced Placement (AP) English credit or College Level Examination Program (CLEP) credit may be substituted for English 101. English 201 or Honor 204 may not be taken using the *P-D-F* grading option.

General Education Requirements for Engineering Majors Only

Learning Skills Requirement (10 credits) including:

(a) at least one course from Group 1, and (b) courses from at least 2 of the 6 subject areas. See current *Schedule of Classes*.

Broadening Knowledge Requirement (30 credits)

Credit Distribution

Humanities and Arts (HU)	Social Sciences (SS)	Life Sciences (LS)	Physical Sciences (PS)	Integrative Option (IO)
5-16	5-16	0-6	0-5*	0-9**

*Outside the courses taught by the major.

**Integrative Option (IO) courses are not required, but may be used to satisfy up to 9 of the 30 credits required for the Broadening Knowledge Requirement. Only one IO course taught by a department in the Physical Sciences quadrant may be selected.

Transfer Students

Transfer students coming to USU with an Associate Degree from a Utah college or university have been deemed as meeting the USU General Education Requirements, but not necessarily the College of Engineering requirements. Students with transfer credits in General Education areas will need to have their transfer credit evaluated by the College of Engineering to determine if it will satisfy USU and/or College of Engineering General Education requirements.

College of Engineering General Education Requirements (28 credits minimum)

Breadth Requirement (19 credits minimum)

Complete at least one course in four of the five breadth and depth areas. Econ 200 is required.

Breadth Areas

1. Fine and Performing Arts

Art HU 101 (3)	Musc HU 102 (3)
Art HU 275 (3)	Musc HU 201 (3)
Art HU 276 (3)	Musc HU 300 (3)
Art HU 277 (3)	Thea HU 101 (5)
LAEP HU 103 (3)	Thea HU 140 (5)
Musc HU 101 (3)	Thea HU 201 (3)
Humanities CLEP (if 3 or more credits earned) (3)	
AP English (Score of 3, 4, or 5) (3)	
Literature classes	

Humanities transfer credit may also count in the Fine and Performing Arts area.

2. Civilization and Social Institutions

Anth SS 101 (5)	Hist SS 105 (5)
Anth SS 102 (3)	Hist SS 170 (5)
Engl HU 121 (3)	PolS SS 101 (4)
Geog SS 101 (5)	PolS SS 110 (5)
Hist SS l04 (5)	Soc SS 101 (5)
SS/History CLEP (if 3 or more credits earned) (3-10)	
AP History (score of 3, 4, or 5) (12)	

Social Science transfer credit may also count in the Civilization and Social Institutions area.

Depth Requirement (12 credits minimum)

Select a minimum of 12 credits in one of the three depth areas. Three credits must be at the 200 level or above, and three credits must be at the 300 level or above. Credits earned as part of the Breadth Requirement are included in the 12 credits required for the Depth Requirement.

Depth Areas

3. Impacts of Technology on Society

Comm SS 121 (4)	Econ 501 (4)
ECE IO 260 (5)	FR 510 (3)
Econ AI 200 (req.) (5)	Geog IO 171 (5)
Econ SS 201 (3)	Geog 351 (3)
Econ 401 (3)	NR IO 101 (3)
Econ 500 (4)	PolS 380 (3)
	PolS 418 (4)

4. International Perspectives

Anth SS 150 (5)	Geog SS 103 (5)
Anth IO 210 (3)	Ling 390 (3)
Anth 453 (3-4)	PolS SS 210 (5)
Econ 515 (3)	PolS SS 220 (5)
Econ 580 (3)	PolS 310 (3)
Engl HU 122 (3)	PolS 343 (3)
	Soc 420 (3)

Foreign Language classes at the 200 level or above may also count in the International Perspectives area.

5. Human Behavior and Value Systems

Anth 401 (3)	Phil 327 (3)
Comm 417 (3)	Psy SS 101 (5)
Engl HU 120 (3)	Psy SS 121 (3)
FHD SS 304 (3)	Psy SS 140 (4)
LAS IO 125* (3)	Soc SS 140 (3)
MHR SS 311 (4)	Soc IO 238 (3)
Phil HU 101 (5)	Soc 330 (3)
Phil HU 111 (4)	Humanities CLEP (if 6 or more credits earned) (3)
Phil HU 215 (3)	AP English (score of 3, 4, or 5) (3)
Phil 326 (3)	

*See college academic adviser before choosing this class.

Academic Service Offices

The offices listed below provide students and faculty with up-to-date academic information and advisement related to student admissions, registration, academic program planning, and graduation at the University.

Individual Program of Study, Planning, and Progress Guides are available through the University Academic Service Center. Major Requirement Sheets are available through the academic departments or the University Academic Service Center.

University Academic Service Center—SC 302, 797-1128

Division of General Registration—SC 302, 797-3373

College Academic Service Offices

College of Agriculture, AG S 218, 797-2267
College of Business, B 306, 797-2275

College of Education, EDUC 101, 797-1442
College of Engineering, EC 110, 797-2705
College of Family Life, FL 205A, 797-1530
College of Humanities, Arts and Social Sciences, SC 304, 797-4029
College of Natural Resources, NR 112, 797-2448
College of Science, SER 101, 797-3509
Science/HASS Advising Center, SC 304, 797-3883
Undeclared Advising Center, SC 304, 797-3883

Planning the Individual's Program

The student's academic adviser is the key person to assist the student in planning programs. The adviser should be consulted as early as possible in the development of a program of study.

Since the purpose of General Education is to strengthen learning skills, to integrate knowledge, and to broaden educational background, students should select from the approved courses those that will serve these functions. If a student has special interests outside his or her major, this is a chance to expand understanding of these interests. If a student has not yet chosen a major, courses may be selected which introduce the student to the fields being considered.

Upper-Division Requirements

A minimum of 60 credits of upper-division work is required for graduation.

Major Subject. Students should select a major subject upon entering the University or early the first year, but not later than entrance into the upper division. As soon as the major subject has been selected, the student should contact the department in which he or she has decided to major. The dean or the head of the department will assign an adviser. Registration in each succeeding quarter should be carefully checked and approved by the adviser to assure proper selection and sequence of courses for satisfying institutional and departmental requirements. If more than one major is being pursued concurrently, departmental and college authorization must be obtained.

Each student must complete a major program of study. This program is comprised of up to 122 credits which includes the major, certification requirements, and all other required major coursework. The program of study for each major is described in the appropriate departmental section of this catalog and on major requirement sheets, which can be obtained from the department, the college, or the University Academic Service Center.

The selection of a major(s), the fulfillment of requirements, and a choice of a career or vocation are the responsibility of the student. The University does not assume responsibility for these choices nor for successful employment upon completion of University programs. However, to aid in these choices, the University provides advising, counseling, and testing services for self-evaluation and information about careers and employment opportunities. For those who request it, the University assists students upon graduation in their search for career placement.

Minor. University policy does not require that all students prepare themselves in a minor field. However, certain departments and/or programs do require the completion of a minor, which is described in the catalog statement of the department or program. When a minor is required, it is part of the professional component.

In the event a student elects to complete a minor not required by the student's major department or program, the student may develop a minor from an approved major in another department. In such cases the elective minor will consist of not less than 18 credits, and the program taken must be approved by both departments.

Special Programs

Honors Program

Director: Daniel J. McInerney
Assistant to the Director: Robyn E. Daines
Secretary: Claudia P. Lewis
Office in Merrill Library 374, 797-2715
Facsimile: 797-3941; E-mail: honors@cc.usu.edu

Academic Adviser: Lynne M. Slade
Office in Student Center 304, 797-3883

Overview

Utah State University's Honors Program, established in 1965, provides a distinctive academic environment for highly motivated undergraduates. Honors is not organized as a separate college or department. Honors students are not required to take additional general education courses, not do they major in Honors. The Honors Program is woven through the University's colleges and departments, allowing students to do enhanced classwork in a portion of their general education courses and a portion of their upper-division courses. Honors students enroll in smaller classes, pursue their studies in greater depth, and enjoy closer contact with professors. Members of the program may take intensive seminars, experimental classes, and interdisciplinary courses. Honors credit is recorded on student transcripts. Students work towards one of three Honors degree options (suited to entering freshmen, upper-division students, transfer students, or reentry students).

The Honors Program serves students who work hard, who raise questions, and who seek answers. It is designed for those wanting to go beyond minimum requirements and narrow specialties. The program benefits students who want to make the most of their university experience. Its members form a community of scholars whose curiosity, creativity, and enthusiasm for learning foster educational achievement and personal growth.

Entering the Honors Program

Eligibility. Honors is open to all incoming freshmen (those who have no university transcripts), regardless of high school GPA or ACT scores. Students with university transcripts,

including transfer or reentry students, as well as students with concurrent enrollment credit, must have a minimum cumulative GPA of 3.3 to join the program. There are no extra fees to pay.

Application and Registration. Students may apply for admission to the Honors Program in Merrill Library 374. For advice on Honors course selection, contact the program's academic adviser, Lynne M. Slade, in Student Center 304.

Selecting a Starting Point. Students still needing to complete their general education requirements should begin with Honr 104H, Orientation to the Honors Program (1 credit, pass/fail, enroll fall or winter quarter). This course provides information about working in Honors. Students should also review the *Honors Course List* (available outside Merrill Library 374) for information about the honors courses regularly offered by departments and colleges throughout the University. The classes listed on this sheet satisfy Honors membership requirements and Honors degree requirements. Most of the classes also satisfy general education requirements. In other words, students can take care of several requirements at once in an Honors course.

Students who have completed all or most of their general education requirements should check the *Honors Course List* to see if there are any classes listed that can be used to finish their general education coursework. If his or her general education coursework is complete, a student may request admission into a departmental Honors Plan allowing students to take upper-division coursework for honors credit and pursue a Department Honors degree. Information is available in the Honors Office (Merrill Library 374) or from the program's academic adviser, Lynne M. Slade (Student Center 304).

Honors Courses

Honors courses feature the University's leading professors, active student participation, and diverse class experiences. The courses emphasize the development of students' skills in writing, speaking, and critical thinking. Students earn Honors credit in the following two types of courses:

1. **Honors dedicated courses,** which are composed entirely of Honors students. These courses feature a small class size, with every class meeting offering accelerated course material. Enrollment is limited to Honors members and Honors-eligible students (those having a minimum 3.3 GPA).

2. **Honors complement courses,** which are an additional component to regular USU courses. In these courses, a small group of Honors students meets separately with the professor to examine course material in greater depth. Enrollment is limited to Honors members and Honors-eligible students (those having a minimum 3.3 GPA).

Upper-division Honors members enrolled in a departmental Honors Plan may also use Honors **contracts** to earn honors credit in coursework leading to an Honors degree.

Honors Degrees

A wide variety of student needs are met with the following three Honors degree options:

1. **University Honors with Department Honors.** Requirements include 40 total Honors credits in lower-division courses selected from the *Honors Course List* **and** upper-division courses within an official department Honors Plan. The creation and presentation of a senior thesis/project and seminar is also required, as is a 3.5 minimum USU cumulative grade point average.

2. **Department Honors.** Requirements include 20 total Honors credits in upper-division courses within an official department Honors Plan. The creation and presentation of a senior thesis/project and seminar is also required.

3. **University Honors.** Requirements include 40 total Honors credits in lower-division courses selected from the *Honors Course List* **and** an individually-designed upper-division plan. The creation and presentation of a senior thesis/project and seminar is also required, as is a 3.5 minimum USU cumulative grade point average.

Listing of Honors Courses

Class offerings change frequently. For the most complete list, see the *Honors Course List* available in the Honors Program office, Merrill Library 374.

Honors Courses

Note: Enrollment in the following courses is limited to students with Honors Program Eligibility (see requirements above).

SK 100H. Library Literacy. Information retrieval skills for research libraries. Limited to students in the Honors Program with fewer than 90 credits. (2F,W)

IO 104H. Orientation to the Honors Program. Orientation to the Honors Program. Required of all Honors students. (1F,W)

200H. Special Topics in Honors. Lower-division course with variable credit. Taught on a one-time trial basis. Courses may be proposed by students, faculty, or the Honors director. (1-5F,W,Sp) ⊗

WC 204H. Writing Seminar. Creative and expository writing, exploring publication procedures, drafting, revising, sentence building, writing with vigor, voice, and paragraph building. (3F,W)

HU 240H. Arts In Interesting Times. The relationships and synergism between fine art, music, landscape architecture, and poetry with the social, economic, and political milieu in which they develop. Team-taught by arts faculty. (3Sp)

320H. Godel, Escher, Bach: An Eternal Golden Braid. An examination of the relationship of art, music, and mathematics from the significant book by Hofstaedter. (1W)

IO 390H. Independent Study. Sections 1, 3, 5. A student registering for independent study is expected to work in a one-to-one relationship with a faculty member, studying material of the student's own choosing with a minimum of supervision. Independent research, both library and laboratory, as well as other forms of creative effort qualify for this credit. Limited to students actively pursuing an Honors degree. (1-5) ⊗

400H, 401H, 402H. Reading Seminar. An opportunity to read, discuss, and write about classic books. (1F) (1W) (1Sp) ⊗

420H. Special Topics in Honors. Upper-division course with variable credit. To be taught on a one-time trial basis. (1-5F,W,Sp,Su) ⊗

470H. Honors Fellows. An application of Honors education of senior (or sometimes junior) honors students in the assistance of leading Honors seminars and tutorials. (1-3F,W,Sp,Su)

480H. Honors Senior Thesis/Project Seminar. Oral presentation and discussion of senior thesis projects. May involve guest presentations, focusing on the essential contrasts and similarities in "ways of knowing" among various academic specialties. (1Sp) ⊗

490H. Honors Senior Thesis/Project. All honors students are required to submit a senior project for graduation from the Honors Program. It may be in any area of the student's choice, written in cooperation with an adviser drawn from the faculty at large. (1-5) ⊗

⊗ Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Applied Technology Education Programs

Director: Maurice G. Thomas

Applied Technology Education Council: Lloyd W. Bartholome, Robert C. Lamb, V. Philip Rasmussen, Maurice G. Thomas, H. Grant Vest, Jr.

Programs

Agricultural Machinery Technology—Department of Agricultural Systems Technology and Education

Office Systems Support—Department of Business Information Systems and Education

Drafting—Department of Industrial Technology and Education

Aeronautics—Department of Industrial Technology and Education

Dairy Herd Management—Department of Animal, Dairy and Veterinary Sciences

Swine Management—Department of Animal, Dairy and Veterinary Sciences

Ornamental Horticulture—Department of Plants, Soils, and Biometeorology

Nursing—College of Science (with Weber State University)

Objectives

The primary purpose of applied technology education programs is to prepare people for employment. Utah State University has developed applied technology education programs within role assignments by the State Board of Regents with the support of the State Board of Education. Students earn certificates, diplomas, or Associate of Applied Science degrees in programs of one or two years in length.

Industry advisory committees provide valuable input to insure relevant programs. Follow-up study of graduates is used as one important method to maintain program quality.

Further information concerning these less-than-baccalaureate applied technology education programs may be found in the section *Certificates, Diplomas, and Associate of Applied Science Degrees* on page 18 and in the following departmental sections: Animal, Dairy and Veterinary Sciences, Agricultural Systems Technology and Education, Plants, Soils, and Biometeorology, Business Information Systems and Education, and Industrial Technology and Education.

It is the policy of this institution not to discriminate on the basis of race, color, national origin, sex, or handicap in any applied technology education program or activity.

Jointly Sponsored Programs

Utah State University participates with four school districts and the Bridgerland Applied Technology Center. Cooperatively sponsored applied technology education programs are offered in University facilities. These programs offer a choice to students of earning a certificate (admittance through BATC) or earning college credit and a certificate or diploma (admittance through the University).

Area Studies

Program Coordination: College of Humanities, Arts and Social Sciences

Contact: Jennifer W. Tingey, Science/HASS Advising Center, Student Center 304, 797-4029

The Area Studies Certificate program is an interdisciplinary approach to the study of a geographical or thematic subject. The program is available to undergraduate and graduate students. It is not a major and does not lead to a degree. Rather, it is designed to strengthen an academic degree and provides an opportunitity for a student to enlarge the scope of the educational experience through an in-depth study of a sector of the world or thematic problem. Where appropriate, courses that apply to the major, minor, or other graduation requirement may also apply to the Area Studies Certificate.

Students may earn the following Area Studies Certificates:

British and Commonwealth Studies
Communicating Across Cultures
International Development
Law and Society
Liberal Arts and Sciences
Religion
Women's Studies

For specific requirements for each of these certificates, see program brochures.

In addition, **a self-designed Area Studies Certificate**, tailored to the student's individual interests, is available. Examples of these are: **Black Studies, Folklore, Russian Studies,** and **Latin American Studies**. A student takes a minimum of 36 credits related to the area of study from at least three disciplines, such as economics, natural resources, political science, sociology, literature, history, geography, and philosophy. A GPA of 3.0 must be maintained in courses applied to the certificate.

A student who completes the Area Studies program is awarded a Certificate at the time of graduation. The information is also noted on the graduation program and on the student's transcript. Graduate students are awarded the Certificate at the end of the quarter in which they complete the requirements.

For a more detailed description of the requirements for this program, contact the Program Coordinator, Student Center 304.

Asian Studies

Program Coordination: College of Humanities, Arts and Social Sciences

Director: Yun Kim, Main 224K, 797-1231

Co-Program Director: R. Edward Glatfelter, Library 234, 797-1196

The Asian Studies Program is designed to provide students with a rich, interdisciplinary experience leading to a Bachelor of Arts degree or a minor in Asian Studies. The program focuses on

East Asia, South Asia, Southeast Asia, and West Asia or the Middle East. Archaeological evidences suggest that humans first occupied Southwest Asia more than half a million years ago, and fully modern humans began living an advanced hunting and gathering life in Asia some 60,000 years ago. Asia is a collection of some 38 independent nations, some with more than 6,000 years of written history and others only recently becoming independent nations. It is in Asia that the world's major religions originated. Hinduism, Buddhism, Judaism, Christianity, Zoroastrianism, Confucianism, Taoism, Shintoism, and Islam all have origins traced to West, South, and East Asia. A tremendous upsurge of social and economic development in many of the Asian countries deserves closer study and examination to assure harmonious social and economic development between the United States and Asia. The Asian Studies program provides an opportunity for students to develop an insight and knowledge of Asian people, their history and languages, and their political, economic, and cultural lives. Asian languages taught at Utah State University include Japanese, Chinese, Korean, Hindi, Urdu, and Arabic.

A major in Asian Studies requires a minimum of 40 credits approved by the program director. In addition, 25 credits of an Asian language are required for graduation. At least one quarter living and studying in an Asian country is recommended for all Asian Studies majors. Residency abroad programs may be arranged through USU affiliated or contact universities or through the International Student Exchange Program (ISEP). Students are encouraged to earn a double major by combining an Asian Studies major with a major in another field.

A minor in Asian Studies requires a minimum of 35 credits approved by the program director. At least 10 credits of an Asian language are recommended.

The program is open to interested Utah State University students having a minimum 2.00 grade point average. A minimum 2.50 GPA in the major or minor courses is required. For more specific information, see the program directors, the Asian Studies Program brochure, or page 53 of this catalog.

Exchange Programs

Utah State University participates in several student exchange programs, including Cultural Exchange, National Student Exchange (NSE), and International Student Exchange (ISEP).

Cultural Exchange

Cultural exchange opportunities are available to USU students, both in the credit and noncredit mode. The programs include quarter-length programs in Spain, Germany, France, and Russia, as well as international and domestic tours to many countries and states. Further information can be obtained from Languages and Philosophy Department, USU, Logan, Utah 84322-0720, telephone (801) 797-1209.

National Student Exchange

National Student Exchange (NSE) is a group of over 120 colleges and universities in the United States. NSE is designed to: (1) provide students with options for educational travel and study at minimal cost, (2) provide educational opportunities in academic studies not available at USU, and (3) create an appreciation of diverse ideas and value systems.

Students normally participate in NSE during their sophomore or junior year. For further information, contact LaVell Saunders, Student Center 302, 797-1132.

International Student Exchange Program

Through the International Student Exchange Program (ISEP) students can study in Africa, Asia, Australia, Canada, Europe, Latin America, or Oceania. ISEP offers traditional European study abroad opportunities at some of the leading institutions in Austria, France, Belgium, Germany, Hungary, and the United Kingdom. Exciting new opportunities for study in such countries as the Ivory Coast, Fiji, Bangladesh, Ghana, Japan, and Togo are also offered.

ISEP participants matriculate directly into a host institution abroad. Direct matriculation means that participants register as regular students at their host institution, take the same courses, have the same assignments, and participate in the same activities as all other students at that institution.

For more information about ISEP, contact the Study Abroad Office, Student Center 304, 797-0601.

Study Abroad Program

The USU Study Abroad Program, under the direction of Brian L. Pitcher, provides information concerning a range of programs offering opportunities for study all over the world. Some of the programs originate with USU, while some are offered in conjunction with other Universities.

Study Abroad offers exchange opportunities at Kansai Gaidai University, Osaka, Japan; Keimyung University, Taegu, Korea; Pusan National University, Pusan, Korea; Hassan II University, Morocco; and Nan Kai University, Tianjin, China. The Department of Languages and Philosophy offers quarters in Spanish language sites, as well as summer quarters in Germany (Freiburg, Bavaria) and France (Avignon and Aix-en-Provence). The Secondary Education Department offers a "student teaching in the Orient" program in Kobe and Okinawa, Japan, as well as in Seoul, Korea.

For additional information, contact the Study Abroad Office, Student Center 304, 797-0601.

Disability Resource Center

The purpose of the Disability Resource Center is to help students with disabilities overcome physical, educational, or attitudinal barriers which may prevent them from reaching their full educational potential. Staff members coordinate University support services, thus aiding students in becoming integrated into the campus community.

The Disability Resource Center is located in Room 104 of the Taggart Student Center and can be reached by telephone by calling 797-2444 voice/TDD.

Services offered by the Disability Resource Center include:

1. Campus orientation, architectural access, and modification. Accessibility map is available.

2. Registration assistance, including interpreters, advisers, and escorts.

3. Equipment loan and Assistive Technology Laboratory, including FM amplification systems, tape recorders, aids for the visually impaired, and adapted computer hardware and software.

4. Referral information regarding campus and community services, including a referral registry for nonacademic interpreters, readers, personal care attendants, and escorts.

5. Taped textbooks, provided by volunteers recruited and trained by the Disability Resource Center, in cooperation with the Utah State Library for the Blind and Physically Disabled. Kurzweil Reading Machine and CCTV enlarging devices are available.

6. TDD and telephone interpreting, available in the Center during business hours.

7. Counseling for academic and personal needs.

8. Support service coordination with the Division of Vocational Rehabilitation for resident and nonresident students. Services include tutors, interpreters, and readers.

9. Assistive Technology Laboratory includes computers, adapted input devices, voice synthesizers, closed captioned decoders, scanners, and enlarged output devices.

General Registration

Director: J. Rodney Clark
Office in Student Center 302, 797-3373

General Registration is an administrative-academic office maintained at USU for the enrollment of students who do not meet the admissions requirements of the eight academic colleges.

The primary function of the office is to assist and encourage students in the improvement of their academic status so they may transfer to the major of their choice. To accomplish this purpose, participants are urged to limit their course loads each quarter, satisfy remedial requirements when indicated, and meet frequently with an adviser or the director. Students in General Registration are encouraged to take General Education and exploratory classes and not begin taking departmental major programs until they have been admitted to a department, though they may take some lower-division survey courses in their intended major. The facilities of the University Counseling, Learning and Life Skills, and Testing Centers are available to assist such students with career, aptitude, life skills, and study skills counseling.

The Low Scholarship and Probation Policies of the University apply to students enrolled in General Registration. When a student has satisfied remedial course requirements and has demonstrated ability to maintain a 2.0 GPA, that student may apply for admission to an academic college and department through the Director of General Registration. Regular college admissions evaluations procedures will then be made, and if there are no admissions restrictions, the student will be enrolled in the department of his or her choice.

Cooperative Education Internship Program

The Cooperative Education Internship Program offers both undergraduate and graduate students a unique opportunity to integrate career, social, and personal development into the educational process. The program is designed to allow students to alternate classroom study with a series of paid preprofessional work experiences related to their field of study. These experiences increase in complexity as the student's background in a given field increases.

The program offers several specific benefits to students. It provides those students who have decided on an academic major an opportunity to obtain pregraduation work experience in their chosen career. The program provides those students who are unsure of their academic major an opportunity to explore several career possibilities. It provides them a chance to earn money for their education and credit toward their degree. Finally, it substantially improves the students' opportunities for employment after graduation.

The Cooperative Education Internship Program option is available in all departments on the Utah State University campus. Generally speaking, students begin their work experiences in their sophomore or junior year, although seniors can be placed. Students can undertake either part- or full-time work experiences. Work experiences are available both during the academic year and during the summer. These work experiences may be with a single employer or with different employers; increasing complexity is the critical principle. Salaries vary with the field of work and the complexity of the job.

The amount of academic credit awarded for a given work experience varies from one department to another. The decision regarding credit and the amount to be granted rests with the academic department, and specifically the faculty co-op coordinators. Students must make the credit arrangement with their faculty co-op coordinators prior to their work experience.

Students interested in entering or learning more about the program should contact their academic department or visit the Cooperative Education Internship Program Office, which is located in University Inn 102, or call 797-3588.

Learning and Life Skills Center

College students' lives are fast-paced and filled with challenging adjustments. To meet these challenges, students must have a repertoire of learning and life skills. These skills, necessary throughout a person's life, enable students to experience success and satisfaction in school, at work, and in personal relationships.

The Learning and Life Skills Center helps students to acquire these skills by providing (1) basic learning and life skills training for those who believe they lack adequate skills and (2) enrichment training for those who desire to improve upon already satisfactory skills. The general goals of the Learning and Life Skills Center programs are to support the academic mission of the University and to help students succeed in their educational program and interpersonal relationships. The center supports these goals in the following ways:

1. General learning strategies and specific skills appropriate to students' needs and goals are provided. This is accomplished through evaluative, preventive, and developmental services.
2. The center integrates and coordinates learning and life skills services offered throughout the University.
3. Students are referred for additional services that can help meet their academic and personal needs.

Services available through the Learning and Life Skills Center include:

Personalized Assessment. A study skills inventory including recommendations for on-campus assistance and services.

Idea Sheets. Free handouts dealing with learning and life skills topics.

Tutoring. Free drop-in tutoring in the Math 002 through 200 series.

Workshops. Free workshops on learning and life skills topics.

Information Resources. Selection of videos, tapes, brochures, and articles addressing a variety of learning and life skills topics.

Supplemental Instruction. Review and study skills instruction provided to students enrolled in identified "high risk" classes.

Presentations. Presentations, given on request, to campus groups, classes, student orientations, etc.

Training. Staff and student training in learning and life skills education. USU Acquaintance/Date Rape Prevention/Education Program is a separate campus-wide program coordinated through the center.

Classes. The center offers the following classes, which can be taken for credit: Psy 173, Personal Study Efficiency; MHR 116, Life Management Skills; Psy 175, College Reading and Listening; and a tutor training class.

The Learning and Life Skills Center is part of the Division of Academic Support Services. The office is located in SC 302, and the Center is located in SC 304A.

Reserve Officers Training Programs

Curricula in Aerospace Studies and Military Science are divided into Basic and Advanced courses. The first two years (Basic) total 12 credits (Air Force) and 9 credits (Army). Up to 28 credits are given for both the Air Force and Army Advanced courses. Enrollment in the Basic course is voluntary and incurs no military obligation. The Air Force Advanced course incurs an active duty obligation for those students who are under contract. Army Advanced course cadets may apply for active duty or for duty with the Army Reserve or National Guard. They may also participate in a unique opportunity to maximize the financial benefits of ROTC while in college through simultaneous enrollment in the Army ROTC Advanced course and the National Guard or Reserve.

There are sufficient elective credits within most degrees offered by the University for a student to apply ROTC credits (maximum of 40 Air Force or 34 Army) towards a degree.

A student should consult an adviser to determine which ROTC credits can be applied toward a specific degree. For detailed ROTC requirements and course information, see the Department of Aerospace Studies and Department of Military Science sections of this catalog.

Academic minors are available in Aerospace Studies and Military Science. Interested students should check with the appropriate department for details.

Marine Corps

The U.S. Marine Corps offers commissions to a limited number of qualified college students through the Platoon Leaders Class and the Officer Candidate Class programs.

Students may enroll in the Platoon Leaders Class while freshmen, sophomores, or juniors. All precommissioning training is completed by attending two six-week training periods during the summer. Members of the Platoon Leaders Class receive commissions as Second Lieutenants upon graduation from college.

Students must maintain a *C* average or better and be at least 17 years of age. More information may be obtained from any Marine Corps Officer Selection Officer.

Special Certificate Programs

Special Certificates may be awarded as supplements to degree programs when authorized by the University. Currently Special Certificates are granted to recognize areas of emphasis and interdisciplinary concentrations. These include the Area Studies Certificate; the International Relations Certificate; and the Music Certificate in Pedagogy of Piano, Organ, or Guitar, all in the College of Humanities, Arts and Social Sciences. The Gerontology Certificate is awarded in the College of Family Life.

Substance Abuse Prevention/Education

Director: JoAnn R. Autry
Office in University Inn 127, 797-1010

The Office of Substance Abuse Prevention/Education (OSAPE) provides education, assessment, and referral. The office provides assistance for persons struggling with substance abuse/addiction problems. The OSAPE staff works with these individuals to determine the role substance abuse is playing in the five areas of life: educational/economical, social/relationships, physical, mental/emotional, and spiritual. OSAPE also offers the following services to students, staff, and faculty:

1. Educational programs for judicially mandated, self-referred, or any interested student, staff member, or faculty member. Alcohol, tobacco, and other drugs; issues concerning children of alcoholics; and women's issues are discussed in the classes.

2. Referral to the proper agency when the required help is not available on campus.

3. Presentations to all student organizations, including fraternities, sororities, residence halls, athletic teams, and campus-based student clubs. These presentations, which are excellent supplements to academic course material, can be scheduled by faculty members for inclusion in their classes.

4. Student involvement in teams offering prevention activities and promoting healthy lifestyles. Also available is training in how to talk to someone with a substance abuse problem. Leadership opportunities for students are abundant.

5. Prevention programs such as National Alcohol and Drug Awareness Week, National Drunk and Drugged Drivers Week, National Safe Spring and Summer Breaks, National Ribbon Week, and many more.

6. Research and surveys to aid in prevention efforts and compare USU with local and national norms.

7. A library of up-to-date information on substance abuse and health issues. Anyone interested may check out materials from the library.

Women's Studies

Program Coordination: College of Humanities, Arts and Social Sciences
Contact: Pamela J. Riley, director, Main 224G, 797-1256

The Women's Studies program is multidisciplinary and focuses on the changing roles of women and men in society. It provides the individual student an opportunity to become academically involved in a program which deals with the socialization and gender roles of adults together with analyses of these roles and changes from early childhood. The program also emphasizes the contributions of women in the past, during the present, and toward the future. By providing insight into the effects of changing role patterns on both women and men, the Women's Studies program prepares students to better cope with current and future changes and to become an influential force in the shaping of those changes.

A number of Women's Studies courses are being taught by faculty members in departments throughout the campus each quarter, and more courses are being developed to meet the current and future needs of the program.

Students may enroll in individual courses or apply coursework toward either a minor in Women's Studies or an Area Studies certificate.

Further information may be obtained from the director (Main 224G) or the Science/HASS Advising Center (Student Center 304).

Liberal Arts and Sciences Program

Director: Ann Leffler
Office in Library 224, 797-2039

Associate Director: Norman L. Jones
Office in Main 323A, 797-1293

Associate Director: Donald W. Fiesinger
Office in Geology 205A, 797-1274

Adviser, Science/HASS Advising Center
Office in Student Center 304, 797-3883

The Liberal Arts and Sciences Program (LASP) has been cited by the American Association for the Advancement of Science as one of four national model major programs integrating the sciences and liberal arts. It has also received a National Endowment for the Humanities award. Its Area Studies Certificate is *Option II* for fulfilling the General Education broadening knowledge requirements described in the General Education section of this catalog.

Option II (LASP) was created to offer USU students an in-depth way to complete General Education requirements, while discovering meaningful relationships among their courses. It combines "back to basics" rigor with an interdisciplinary emphasis on themes for the twenty-first century. While LASP includes a major and a minor, its emphasis and pride is the Area Studies Certificate, *Option II*, which marks a track through the *Broadening Knowledge* portion of General Education which is imbued with the spirit of numerous national calls for educational reforms. Corporate executives, community leaders, and national educators increasingly recognize that in a society where one-fourth of today's jobs did not exist fifteen years ago, a broad background in liberal arts and sciences is the best possible training for productivity. LASP offers USU students training to contribute effectively in the organizations, professions, and communities of tomorrow.

To encourage interdisciplinary learning and curricular coherence, sets of LASP courses are clustered around common themes. This cluster organization encourages students to combine insights across the sciences and liberal arts and to regard education as a tool for addressing central issues rather than as a disparate array of unrelated courses. Each course cluster concludes with a capstone course connecting what students have learned in the cluster. Each aims to help students pursue the LASP objectives listed below.

Objectives of the Liberal Arts and Sciences Program

Promoting interdisciplinary learning, LASP encourages students to develop the following:

(1) Abilities for critical thinking and communication

(2) An understanding of numerical data

(3) An understanding of the methods and systems of natural science

(4) Historical consciousness

(5) An understanding of social science

(6) An awarenesss of ethics

(7) A recognition of multicultural contexts

(8) An appreciation and experience of fine arts

Curricula in Liberal Arts and Sciences

The Liberal Arts and Sciences Area Studies Certificate provides the *Option II* track through the *Broadening Knowledge* portion of General Education requirements. This certificate is described below. In addition, the Liberal Arts and Sciences major offers two degree programs, each leading to a Bachelor of Arts degree. These too are described below.

I. Liberal Arts and Sciences Program

(A) Liberal Arts and Sciences Area Studies Certificate. This route through the *Broadening Knowledge* portion of General Education requires the LASP orientation course, LAS 125, as well as two LAS clusters. The minimum number of credits required is 46. A minimum 2.5 GPA must be maintained in the certificate courses. As of fall 1996, five clusters are available: Beauty, Civilization, Science and Society, Future Environments, and Matter and Spirit. Please consult the Science/HASS Advising Center (Student Center 304) or a LASP staff member for current information on cluster status and requirements.

Upon graduation, students completing the Liberal Arts and Sciences certificate will receive notation of its completion on their transcripts.

(B) Liberal Arts and Sciences Minor. While gaining a perspective on the liberal arts and sciences, students may want to explore more than two clusters. The minor supplements students' academic majors by widening employment options. It consists of LAS 125, three clusters, and at least 66 credits. Please consult the Science/HASS Advising Center or a LASP staff member for details.

(C) Liberal Arts and Sciences Option: The Major. The LASP major allows students to explore and integrate the sciences and the liberal arts in depth. It requires LAS 125, two clusters, and some combination of specific courses in the languages, mathematics, deductive logic, computer science, depth of knowledge credits, field or laboratory courses, self-expression courses, literature study, research methods, and a senior thesis. It also requires a 2.3 GPA overall for admission and graduation. Again, please consult the Science/HASS Advising Center or a LASP staff member for details.

II. Liberal Arts Option

The Liberal Arts option is a separate track under the Liberal Arts and Sciences Major. This option allows the student to develop an individualized curriculum in consultation with the program adviser, Ms. Mary Leavitt (Student Center 304). Unlike Liberal Arts and Sciences, it does **not** offer a route through General Education directly. This option also requires a 2.3 overall GPA for admission and graduation.

Although the emphasis of this option is in the humanities, arts, and social sciences, the student is encouraged to seek out other educational interests as part of an academic program. The following credit distribution will be typical of most students:

General Education (46 credits)

Foreign Language (25 credits)

Liberal Arts Emphasis. The focus of study for the Liberal Arts option is to help students gain a basic understanding of the development of civilization, including historical and cultural traditions, political institutions and processes, an appreciation of arts and literature, and expanded capacities for critical thought. Four learning goals are identified, each requiring a minimum of 15 credits, for a total of 60 credits.

Students will plan a multidisciplinary academic program which provides a focus for study, with emphasis in primarily social sciences, humanities, and arts.

Preprofessional and Elective Credits (55 credits)

Depending on a student's career objectives, a student may take courses leading to further study in medicine, law, business, or other graduate programs, or continue to study in a number of different disciplines.

Liberal Arts and Sciences Courses

IO 125. Pathways to Knowledge. Orientation to the Liberal Arts and Sciences Program. Focuses on major themes in thought, creativity, and public life as preparation for responsible participation in the world of the twenty-first century. (3F,W,Sp)

480. Senior Thesis Preparation. Open to Liberal Arts and Sciences majors only, this pass/fail course helps students begin their senior theses. Prerequisite: junior standing. (1F,W,Sp)

490. Independent Workshop/Study. Independent, interdisciplinary study resulting in an original work. After obtaining permission from a Liberal Arts and Sciences adviser to take this course under the supervision of a particular instructor, the student must also obtain the instructor's permission. (1-5F,W,Sp) ®

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

College of Agriculture

Dean: Rodney J. Brown
Office in Agricultural Science 223, 797-2215

Associate Dean for Extension: Ralph E. Whitesides
Associate Dean for Research and Director, Agricultural Experiment Station: H. Paul Rasmussen

The College of Agriculture includes the following departments:

Agricultural Systems Technology and Education
Animal, Dairy and Veterinary Sciences
Economics[1]
Nutrition and Food Sciences[2]
Plants, Soils, and Biometeorology

Degrees and curriculum options are listed in the department section of this catalog. In addition to programs in the departments, there are two curricula that involve more than one department: (1) a BS degree in international agriculture and (2) MS and PhD degrees in toxicology.

Agriculture today is a dynamic, rapidly changing industry. It includes more than farming or producing food and fiber. It embodies all the occupations connected with the production, processing, marketing, and distribution of farm products.

Agriculture is the nation's largest industry. Of the 131 million people employed in the United States, about 21 million (16 percent) work in agriculture. This includes about half a million scientists who serve agriculture directly or indirectly. The agricultural industry is the biggest buyer, seller, and borrower in the United States, and it has the largest investment of any industry.

Today's agriculture offers graduates challenging opportunities in a highly technological and competitive society. Students must be prepared to interact in such a society when they complete their formal education.

The success of various curricula in agriculture is manifest by the achievements of the graduates. They are setting new standards for agricultural production and in positions as professional specialists, teachers, research investigators, and leaders in agriculture and related industries locally, nationally, and internationally.

Education in agriculture includes fundamental science as well as applied business and technology. Many graduates continue their education for advanced degrees and other specialized education and training.

Admission Requirements

Undergraduate students accepted in good standing by the University are eligible for admission to the College of Agriculture.

[1]Jointly administered with the College of Business.
[2]Jointly administered with the College of Family Life.

Facilities and Equipment

The Agricultural Science Building houses the administrative offices of the College of Agriculture, the Agricultural Experiment Station, and University Extension, as well as the Plants, Soils, and Biometeorology Department. The Animal, Dairy and Veterinary Sciences Department personnel are housed in the Agricultural Science Building, the Animal Sciences Building, and the Veterinary Science Building. The Agricultural Systems Technology and Education Department is located in the Agricultural Systems Technology and Education Building. Economics is housed in the Business Building. The Department of Nutrition and Food Sciences is housed in the Nutrition and Food Sciences Building. Some classes and laboratories are located on Agricultural Experiment Station facilities near the campus, where research and teaching interact. Research units located in more distant areas of the state provide research opportunities for graduate students and faculty members.

Curricula in Agriculture

Students may work toward the Bachelor of Science degree in any of the departments of the College of Agriculture. Preveterinary training is offered in the Department of Animal, Dairy and Veterinary Sciences.

There are three basic curricula offered by most departments: (1) science, (2) general or production, and (3) business. Departmental listings detail the requirements for earning a degree in these curricula.

Science. Students who choose the science curriculum are taught the fundamentals of physical and biological sciences that are significant to agriculture. In the basic science courses, students prepare themselves for graduate work and eventually research and teaching careers in the natural sciences. Graduates in science curricula are also prepared to do research or technical work in agriculturally oriented businesses such as farm chemicals, livestock health, feed processing and marketing, crop breeding, water use, and food processing.

Science curricula are offered in the Departments of Animal, Dairy and Veterinary Sciences, Nutrition and Food Sciences, and Plants, Soils, and Biometeorology.

General or Production. This curriculum is designed to educate students to meet the special demands of today's agriculture. Successful modern agricultural production requires an understanding of the latest scientific knowledge and an ability to apply the information. The production curriculum will satisfy the needs of a student who plans to be involved in production agriculture, to be a farm manager, or to work directly with farm operators as a businessman or as a government or farm organization employee.

This curriculum is offered in the Departments of Agricultural Systems Technology and Education, Plants, Soils, and Biometeorology, and in animal and dairy majors of the ADVS Department.

Business. The businesses and industries that buy from, sell to, and provide service for people involved in production agriculture are expanding the need for men and women educated in

agriculture. These enterprises include feed, fertilizer, machinery, and chemical firms that supply the producer's needs, as well as marketing firms that assemble, process, ship, and merchandise agricultural products. Managers of large-scale farm enterprises also profit from the kind of education provided by the business curriculum. Students who want to capitalize on their agricultural background while pursuing a business or industrial career should consider the business option.

This curriculum is offered in the Departments of Economics, Agricultural Systems Technology and Education, Nutrition and Food Sciences, Plants, Soils, and Biometeorology, and in the animal and dairy majors of the ADVS Department.

Interdepartmental and intercollege cooperation has and will continue to facilitate the development of various other curricula. Students should not hesitate to inquire about the possibilities of following a curriculum that would allow for special needs. Advisers in each department are available and should be consulted for guidance in scheduling classes and in planning careers.

Interdepartmental Major in International Agriculture

There is a great opportunity today for professional agriculturists to serve in foreign countries. There are more than 100 developing countries in the world who welcome help. The interdepartmental major in international agriculture is designed to prepare dedicated students for service abroad. Students choosing international agriculture as a major may specialize in (1) animal and dairy sciences, (2) agricultural economics, (3) plant science, (4) soil science, or (5) agricultural systems technology.

To be sure that all candidates for a degree in international agriculture acquire the essential social and cultural background, a core curriculum of courses is required of all students regardless of technical option. This curriculum and the specific number of credits required for each technical option are as follows:

Core Curriculum. General Education, 40 credits; Written Communication, 9 credits; Agriculture and Agriculture Related, 45 credits. These credits must include: ADVS 111 and 245, 8 credits; PlSc 100, 4 credits; Soil 358, 4 credits; ASTE 101, 300, 301, 345, and 360, 18 credits; ADVS 300, 4 credits; and Econ 303, 304, 6 credits.

Specializations. The following specializations are available and should be worked out between the student and a departmental adviser.

Animal, Dairy and Veterinary Sciences. ADVS: 120, 208, 209, 212, 213, 219, 245, 350, 351, 420, 421, 35 credits; ADVS[3]: 508, 509, 512, 513, 519, 4-16 credits.

Plant or Soil Science. Bmet 200, 3 credits; Soil 470, 555, and 556, 9 credits; Soil 513, or 565 and 566, 5 credits; PlSc 360, 432, 440, 450, 555, 565, 21 credits.

Agricultural Economics. Econ 403, 500, 501, 502, 503, 515, 540, 560, 580, 31 credits; and Hist 104, 105, 10 credits.

Agricultural Systems Technology. PlSc 430, 432, 7 credits; ADVS (4 of 6 production practices courses), 12-13 credits; Econ 580, 3 credits; and ASTE 101, 300, 301, 303, 360, 511, 551, 23-24 credits.

[3]For those desiring advanced animal management courses. Check prerequisites for all courses.

Financial Support

The College of Agriculture and the agricultural industry in the Intermountain West annually sponsor over 100 scholarships, internships, and assistantships. The college and the local agribusinesses also support many students through work experience programs. For further information, contact the College of Agriculture Dean's Office (Agricultural Science 223) and/or individual department offices.

Safety and Liability in Classes and Laboratories

Certain classes and laboratories involve a risk of bodily injury or of damage to clothing. Students should take appropriate precautions and wear suitable protective clothing. Some of the risks include handling or being near animals, slick floors or corrals, use of toxic or corrosive substances, and the use of sharp or breakable instruments and equipment. Students should take safety precautions during demonstrations or work with animal tissues or operative procedures. Students must assume their own liability protection for travel to and from classes, laboratories, and field trips. The University and its employees assume no liability in the performance of classroom or laboratory instruction or on scheduled field trips, or for other dangerous activities. The student, by voluntarily participating in these classes and activities, agrees to assume the risk and not hold USU or its staff liable.

Agriculture Course

191. Orientation to Agriculture. Orients freshman and transfer students to College of Agriculture disciplines, academic and student services, professional organizations, and career choices for students with degrees in Agriculture. (2F)

Agriculture Satellite Courses

350. Agricultural Ethics. Discussion of agriculture's interactions with society in a variety of ways that involve questions of ethics, justice, and social policy. (5W)

450. Agricultural Systems. This course will address major problem areas of modern agriculture, focusing on reasons these problems have developed and exploring possible directions for solutions. (3W)

451. Legal Issues in Agriculture. Among the topics to be covered are: real and property law, contracts, water and environmental law, farm income tax, Social Security, state and federal regulations, and farm organization. (3F)

452. Agricultural Marketing. Introduction to principles and practices associated with the movement of agricultural products from the farm/ranch through the marketing system to the final consumer. (5W)

453. Agricultural Water Management in Rain Fed Systems. The fundamentals of water control and management in rain fed agricultural systems. Principal topics include field measurements of soil water and stream flow, the hydrology of rain fed agriculture, water erosion, managing water conservation and harvesting, and land drainage. (2W)

454. Agricultural Water Management for Irrigated Systems. Topics include irrigated hydrology, soil-water-plant relationships, infiltration and soil moisture storage, crop water requirements and irrigation scheduling, systems design, field measurement, evaluation, and water quality. (3W)

551. Cereal Science. Focuses on the origin, structure, and composition of cereal grains and the way they are processed and used by consumers. (5W)

College of **Business**

Dean: David B. Stephens
Office in Business 202-210, 797-2272

Senior Associate Dean: David H. Luthy
Associate Dean for Business Relations: Ross E. Robson
Associate Dean for Graduate Programs: Michael Parent
Director of Business and Economic Development Services: Gary B. Hansen
Director of the Management Institute: Glenn M. McEvoy
Director of the Small Business Development Center: Franklin C. Prante
Director of the Student Service Center: Karen W. Peterson

The College of Business includes the following academic departments and program areas:

Accountancy, School of
- Bachelor of Science (BS) and Bachelor of Arts (BA) in Accounting
- Master of Accounting (MAcc)

Business Information Systems and Education
- Bachelor of Science (BS) and Bachelor of Arts (BA) in the following major fields: Business Education, Marketing Education, and Business Information Systems
- Master of Science (MS) in Business Information Systems and Education with concentrations in Information Systems Management, Business Education/Marketing Education, and Training and Development
- Master of Education (MEd) in Secondary Education with emphasis in Business Education
- Doctor of Philosophy (PhD) and Doctorate of Education (EdD) in Business Information Systems and Education in cooperation with the College of Education
- Associate of Applied Science (AAS) in Office Systems Support

Business Administration
- Bachelor of Science (BS) and Bachelor of Arts (BA) in the following major fields: Business Administration, Finance, Marketing, and Production Management

Economics
- Bachelor of Science (BS) in Agribusiness Management and Agricultural Economics[1]
- Bachelor of Science (BS) and Bachelor of Arts (BA) in Economics
- Master of Science (MS) and Master of Arts (MA) in Agricultural Economics[1]
- Master of Science (MS) and Master of Arts (MA) in Economics
- Master of Agricultural Industries (MAI)[1]
- Master of Social Sciences (MSS)
- Doctor of Philosophy (PhD) in Economics with emphasis in Agricultural Economics, International Economics, and Finance

[1]See College of Agriculture for economic programs related to agriculture.

Management and Human Resources
- Bachelor of Science (BS) and Bachelor of Arts (BA) in the following major fields: Management and Human Resource Management
- Master of Social Sciences (MSS) in Human Resource Management

College Program
- Bachelor of Science (BS) and Bachelor of Arts (BA) in Business are available as a second bachelor's degree or as a dual major. To qualify as a dual major, the primary major must be outside the College of Business.
- Master of Business Administration (MBA) with areas of specialization tailored to student's needs.

Nondegree programs include a wide variety of seminars and development programs sponsored by the Management Institute, the Business Relations units of the college, and various academic departments.

A variety of specialized diagnostic, consultative, manpower development, and industrial development services are rendered to individual businesses and industry groups, both on site and on campus, through the Small Business Development Center (SBDC).

The research arm of the college provides assistance to all units by insuring state-of-the-art competence of faculty and the appropriate technical base for both academic and outreach programs.

All bachelor's and master's degree programs in business are accredited by the American Assembly of Collegiate Schools of Business (AACSB), the professional accrediting agency in business. This status facilitates transferability of credits to other institutions and acceptance of the credentials of graduates by the business community.

Objectives

The college is engaged in the following three primary areas of activity: education, outreach, and research.

Its **educational objectives** emphasize preparation for professional careers in business. However, the managerial and technical skills associated with such preparation may also lead to careers in other types of organizations such as health service, government, and education. The preparation is directed at both entry-level and midcareer qualifications. Thus, students can be immediately productive on a new job assignment and at the same time have the depth and breadth of education to assume increasing responsibilities. Additionally, experienced managers and business people can pick up needed new capabilities and renew their educational backgrounds. An extensive offering of vocationally oriented programs in clerical and technical fields is also provided. Besides its career orientation, the College of Business educational objectives include a commitment to enhancing the lifelong learning opportunities for responsible citizenship and personal satisfaction where economic and business dimensions are critical ingredients.

In implementing its **outreach objectives**, the college extends its resources and services to off-campus patrons by sponsoring regional centers and by conducting on-site visits to individual

firms and organizations and thereby enhancing the quality of life and economic well-being of citizens of the state.

The college is committed to an aggressive program of **research** to insure the continued enlargement of the base of understanding about business, government, and other complex institutions; about the processes of managing; and about the economic foundations upon which they function.

Admission and Graduation Requirements

New freshmen admitted to USU in good standing qualify for admission to the College of Business. Students with 1-69 quarter hours of credit, who are transferring from other institutions or from other colleges at USU, need a minimum overall GPA of 2.20. Students transferring with 70 or more quarter hours of credit are required to have a minimum overall GPA of 2.50. Upon admission, all degree-seeking students will be identified with the College of Business **Prespecialization Unit** for the purpose of qualifying for advanced standing within their chosen major field. The College of Business Student Service Center, Business 306, administers the prespecialization program for the college and provides initial counseling and guidance until such time as a student qualifies for unconditional advanced standing. Students may declare a major upon admission but will receive advisement through the Student Service Center while preparing for advanced standing. Nondegree-seeking students and Associate of Applied Science students will bypass the prespecialization unit and work directly with the selected program administrators.

Scholarship Requirements for Admission to College of Business Courses. Admission to the college does not insure access to the prespecialization core courses required for graduation. The following admission requirements must be met by all USU students:

1. An overall GPA (transfer credits included) of 2.20 and 30 credits of completed college-level work are required for admission into Acct 201, 203; MHR 299; and BIS 255.

2. An overall GPA of 2.50 and completion of 45 credits are required for admission into Acct 311 and 331.

3. An overall GPA of 2.50 and completion of 60 credits are required for admission into Acct 312, 313, 332, 341; BA 308, 340, 350, 370; BIS 310, 314, 330, 355, 371; Econ 340; and MHR 311, 360.

4. All 400- and 500-level courses in the College of Business, with the exception of Economics courses and MHR 489, are restricted to students with unconditional advanced standing. A 2.50 overall GPA and completion of 90 credits are required for admission into these courses.

5. An overall GPA of 2.50 and completion of 125 credits are required for admission into MHR 489.

General Education and Communication Skills Requirements. Specific requirements for the College of Business are identified in the Communication Skills and Learning Skills areas listed below.

The Communication requirement consists of nine credit hours: Engl 101 or 111 (3 credits), Engl 200 or 201 (3 credits) and BIS 255 (3 credits).

The Learning Skills area consists of 12 credit hours: Math 105 (5 credits), BIS 140 (3 credits), and CS 150 or 170 (4 credits).

The Broadening Knowledge area of general education consists of 30 credit hours divided among four quadrants and the Integrative Option. Credit distribution for the broadening knowledge requirement for the College of Business is as follows: Humanities and Arts (0-6 credits), Social Sciences (0-5 credits), Life Sciences (5-16 credits), and Physical Sciences (5-16 credits).

A maximum of 9 of the 30 required credits in the broadening knowledge area may be in the Integrative Option courses.

Students who entered the School of Accountancy beginning summer quarter 1991 must satisfy separate general education requirements (see departmental write-up).

Prespecialization Program. All degree-seeking students in the college are required to complete the following core program prior to admission to "advanced standing" within the chosen departmental major field: Acct 201, and Acct 203 or 331 (8 credits), with Acct 331 *required* for accounting majors; BIS 255 (3 credits); Econ 200, 201 (8 credits); Math 105 (5 credits); MHR 299 (4 credits); Stat 230 (5 credits); CS 150 or 170 (4 credits); BIS 140 (3 credits); and either Acct, BIS, BA, Econ, or MHR 100 (1 credit). In addition to the foregoing common core of classes for all College of Business degree-seeking students, each major field requires a unique set of prespecialization courses to qualify for unconditional advanced standing within the program area. Refer to the appropriate departmental and program section of this catalog for details concerning courses and GPA requirements.

Advanced Standing. The following general requirements must be met before acceptance into unconditional advanced standing in any major field:

1. Completion of 85 credits of college-level courses (or equivalent) with a cumulative grade point average of 2.50 or better is required. This will include all transfer credits. The college and major field prespecialization core program must be included. The current quarter registration may be included in the 85 credits; however, final approval of advanced standing will be contingent upon successful completion of the current quarter with the required grades.

2. Completion of the prespecialization program—both the college core and the major field core—with the following departmental required grade point average:[2]

   a. Accounting—2.50
   b. Business Administration—2.50
   c. Business Information Systems and Education—2.50
   d. Economics—2.50
   e. Management and Human Resources—2.50

3. Filing of an "Application for Advanced Standing" with the College of Business Student Service Center, Business 306.

Upon completion of the prespecialization program, students who choose not to enter a major field program or who do not qualify for advanced standing within a major field will be counseled regarding alternative courses of action.

Course Restrictions. Admission to all 400-level and 500-level courses within the School of Accountancy, the Department of Business Administration, the Department of Business Information Systems and Education, and the Department of Management and Human Resources (with the exceptions of BA, BIS, Econ, and MHR 425) is restricted to the following categories of students:

1. Those having been granted unconditional advanced standing.
2. Graduate students.
3. Those requiring the course for a minor, or to meet requirements of other majors. All course prerequisites, GPA standards, and credit restrictions must be satisfied.
4. Those who have an overall GPA of 2.50 or above and have completed 90 quarter hours of credit.

[2]Operational starting summer quarter 1984. Information concerning any change in grade point requirements is available through the individual departments and the College of Business Student Service Center, Business 306.

Residency Requirement. Forty-five of the last 90 quarter credit hours must be taken in residence on the Utah State University campus or at a designated residence center; 15 of which must be included within the last 60 credits presented for the degree. At least fifty percent of the business credit hours required for a business degree[3] must be taken on the Utah State University campus or at a designated residence center.

Optional P/D+, D, F Grade Restriction. This option (see general University "Grading Policy") is not available for any required courses for majors in the College of Business.

College of Business Stop-out Policy. Students who have a break in their educational experience in excess of one year will be subject to the college and department requirements in effect at the time of their return. However, if a student has received unconditional advanced standing under a previous set of requirements, this will be honored even though advanced standing requirements may have changed.

Graduation. Students must satisfy all University, college, and departmental major field requirements in order to be eligible for graduation. Refer to appropriate sections of the catalog for details. The following departments of the College of Business require that at least 50 percent of the credits for graduation be taken in courses outside the College of Business: School of Accountancy, Department of Business Administration, Department of Business Information Systems and Education, and Department of Management and Human Resources. This requires that at least 93 credits be taken in courses outside the College of Business. For this requirement, up to 13.5 quarter credits (9 semester credits) in the Department of Economics and 9 quarter credits (6 semester credits) of statistics may be counted among those taken outside the College of Business. For GPA requirements in the various majors, see departmental write-ups in this catalog.

Minor in Business

The College of Business offers a minor for nonbusiness majors consisting of the seven courses listed below. This minor is designed to develop a general business background and perspective. Completion of this minor will acquaint students with each business discipline. Advisement for the business minor is through the College of Business Student Service Center, Business 306. An overall grade point average of 2.50 is required for the seven courses taken. Students are responsible for completing prerequisite courses where required. Required courses include: Acct 201; BA 340 or 346; BA 350; BIS 310; Econ 400 or 401; MHR 311; and one of MHR 299 or Econ 340.

Dual Major and Second Bachelor's Degree

The College of Business offers both a dual major and a second bachelor's degree in Business. This particular option requires a broad course distribution among the departments of the college. It is therefore administered by the college, rather than by a specific department. Requirement information is available in the College of Business Student Service Center, Business 306.

See departmental sections of this catalog for requirement information concerning other second bachelor's or dual major degrees within the college.

Graduate Study

For information on graduate programs, see the graduate catalog.

Professional Organizations

The following student organizations are available for membership, depending upon student objectives and qualifications:

American Marketing Association (AMA): Organization for marketing and marketing education majors in the College of Business.

American Production and Inventory Control Society (APICS): Professional society for production majors.

Beta Alpha Psi: Honorary professional accounting fraternity.

Beta Gamma Sigma: Honorary business fraternity.

Association for Systems Management (ASM): Organization for students planning careers in information processing and information systems management.

Delta Pi Epsilon (DPE): National graduate honorary fraternity in business education.

Delta Epsilon Chi (DEX): Cocurricular organization for marketing education and marketing majors.

Economics Club: Organization for students majoring in economics.

Finance Club: Organization for students majoring in finance.

Institute of Management Accountants (IMA): Organization designed for accounting majors.

MBA Association: Organization for MBA graduate students.

Phi Beta Lambda (PBL): Organization designed for business or business education majors.

Sigma Iota Epsilon (SIE): National honorary and professional management fraternity.

Society for Human Resource Management (SHRM): Organization for majors in fields of personnel and human resource management.

Scholarships, Fellowships, and Assistantships

A number of scholarships and assistantships are available to College of Business students at both the undergraduate and graduate levels. See catalog section on "Scholarships and Grants-in-aid." There are also opportunities for employment on research projects and other activities. Assistantships for graduate students are available both for teaching and research. Application may be made directly to the department concerned or to the dean's office.

[3]Exceptions are Business Education and Marketing Education.

College of Education

Dean: Izar A. Martinez
Office in Emma Eccles Jones Education 109, 797-1437

Associate Dean for Education: Deanna D. Winn
Associate Dean for Continuing Education and Field Services: Gary L. Carlston
Associate Dean for Research: Ron J. Thorkildsen
Assistant to the Dean for Technology: J. Steven Soulier

The College of Education has the following departments:

Communicative Disorders and Deaf Education
Elementary Education
Health, Physical Education and Recreation
Instructional Technology
Psychology
Secondary Education
Special Education and Rehabilitation

The College of Education provides preparation programs for prospective teachers, for counselors and other professional personnel in education, and for professionals in the human services area and in corporate settings. Students are urged to refer to the more detailed descriptions of programs, majors, and areas of specialization contained in this catalog. Teacher preparation programs are also offered in the following departments in other colleges: Agricultural Systems Technology and Education, Business Information Systems and Education, Industrial Technology and Education, and Human Environments.

Accreditation. Utah State University is a member of the American Association of Colleges for Teacher Education and is accredited by the National Council for the Accreditation of Teacher Education and the Utah State Board of Education. Students who are certified to teach in the state of Utah may qualify for certification in other states and the District of Columbia.

General Education/Communication Skills Requirements. All students graduating from the College of Education must complete the 40 credits of General Education required by the University and complete a 12-credit program in written communications. Students should work closely with their advisers in planning programs of study to meet all requirements.

Admission Requirements to Teacher Education. Students wishing to enter the Teacher Education Program at Utah State University must formally apply for admittance and be approved by the Office of the Associate Dean for Education as well as the department where the teaching major is being offered. All applicants are required to submit a record of their ACT scores. With the exception of ElEd 100, ScEd 201, and SpEd 301, students are not permitted to enroll in any professional education courses in Elementary and Secondary Education, nor in PEP 460, Psy 366, and ComD 365 prior to being admitted into the Teacher Education Program. All applicants must take the Teacher Education Writing Exam prior to being admitted to the Teacher Education program. Any writing deficiencies must be made up before student teaching.

Detailed information about admission to the Teacher Education Program should be obtained from a departmental adviser or from the Office of the Associate Dean for Education.

Application for admission to professional curricula should be made before the end of the sophomore year, earlier if possible. Transfer students who have had one year of collegiate work may apply during their first quarter at USU.

Teacher Certification. The Dean, College of Education is assigned responsibility for the development, approval, and administration of Teacher Certification requirements for students.

The College of Education currently offers preservice teacher preparation leading to certification in 31 different areas. In addition, advanced programs leading to professional certification are available for administrators, supervisors, school counselors, school psychologists, school library media specialists, speech pathologists and audiologists, and specialists in special education.

Specific requirements for each certificate may be obtained from the Office of the Associate Dean of the College of Education or from the department in which the major work is offered.

For the early childhood, elementary, or secondary certificate, a closely supervised program of student teaching is conducted in selected schools throughout the state. Students should be financially prepared to live off campus during the quarter selected as their professional quarter of student teaching.

The Bachelor of Science degree with a major in elementary education, secondary education, or special education is designed for a student preparing to teach in any of these fields. Students majoring in other departments of the University who wish to prepare for teaching are admitted to teacher education curricula as heretofore described.

Dual Certification. A student desiring to obtain early childhood and elementary education, elementary and secondary, special education and elementary, or special education and secondary education certificates should consult with an adviser in the education departments early in his or her program. Ordinarily, dual certification will require at least one additional quarter of work.

Teacher Placement Service. The Teacher Placement Service functions as an integral part of the University Placement Center. Students may register with the service, which will help in compiling the proper credentials to be used in placement interviews. Application for placement services should be made prior to student teaching whenever possible. No fee is charged for joining the center.

Facilities. The College of Education Edith Bowen Laboratory School is a functioning elementary school on the University campus, serving as a research, demonstration, and teacher training center.

The Center for Persons with Disabilities is a multi-discipline training, research, and service center where students engage in activities of observing, tutoring, practicums, interning, and working individually with materials designed especially for disadvantaged youth and adults.

Graduate Study

Programs at the graduate level, leading to advanced professional degrees and/or certification, are available in the administrative, supervisory, human services, clinical, and counseling areas. The MEd, MS, and MA degrees are offered in most departments. An Educational Specialist (sixth-year) program may be available in some departments. Interdepartmental Doctorate of Education (EdD) and Doctorate of Philosophy (PhD) degrees are available with specializations in Business Information Systems and Education, Curriculum and Instruction, Instructional Technology, and Research and Evaluation. PhD degrees in Psychology and Special Education are also offered. This catalog contains only the numbers and titles for graduate courses in the 600 and 700 series; the *Graduate Catalog* contains more detailed information concerning graduate study, including course descriptions.

Education Courses

500H. Senior Honors Seminar. For students in the College of Education to explore an honors interdisciplinary theme selected by the Honors Committee as a culmination of an Honors experience. (3Sp) ®

556. Practice in Improving School System Programs. Seminar focused upon different phases of the instruction program and upon new and persisting problems in teaching. (1-6)

Graduate[1]

601. Introduction to Evaluation: Evaluation Models and Practical Guidelines. (3F,Su)

608. The School Principalship—Elementary, Middle, and Secondary. (3 Alt Su)

610. Theories of Instructional Supervision. (3 Alt Su)

624. The American College Student and Higher Education. (3Su)

625. Student Personnel in Higher Education. (3W)

641. Social, Cultural, and Philosophical Foundations of Education. (3W,Su)

654. Organization and Control of Public Schools. (3 Alt Su)

655. Research for Classroom Teachers. (3F,Sp)

656. Practicum in the Improvement of Instruction. (1-6)

657. Introduction to Educational and Psychological Research. Prerequisite: Psy 380. (3F,Sp,Su)

660. Descriptive and Inferential Statistics I. Prerequisites: Psy 380, Educ/Psy 657 or Educ 655. (3F,W)

661. Descriptive and Inferential Statistics II. Prerequisite: Educ/Psy 660. (3W,Sp)

669. Introduction to Comparative and International Education. (3Su)

674. School Law. (3 Alt Su)

677. Introduction to Qualitative Research. Prerequisite: Educ/Psy 657 or Educ 655. (3F,Su)

678. Advanced Qualitative Research. (3Su)

684. Workshop in Gifted and Talented Education. (1-3Su) ®

700. Research Designs in Educational and Psychological Research. Prerequisites: Educ/Psy 661 and Educ 677. (3Sp,Su)

703. Data Collection Techniques in Evaluation. Prerequisite: ScEd 604. (3Sp)

710. Practices of Instructional Supervision. Prerequisite: Educ 610. (3 Alt W,Su)

715. Curriculum Theory. Prerequisite: ElEd or ScEd 615. (3W, Alt Su)

730. Social, Historical, and Cultural Foundations of Education. Prerequisite: Educ 641. (3-6F,Su)

731. Teaching-Learning Foundations in Education. Required EdD seminar. Prerequisite: Graduate general course in educational psychology. (6)

732. Instructional Leadership. Prerequisite: Educ 710. (6Su)

737. School-Based Internship. (3-6F,W,Sp,Su)

750. School Finance. (3 Alt Su)

767. Designing Educational and Psychological Research. Prerequisite: Educ/Psy 700. (3F,Su)

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[1]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

College of *Engineering*

Dean: A. Bruce Bishop
Office in Engineering Class 110, 797-2775

Associate Dean: Alma P. Moser
Associate Dean: Ronald L. Thurgood
Academic Adviser: Kathleen E. Bayn
Academic Adviser: Janet Hanson
Industry and Professional Relations Director: Robert L. Davis
Research Proposal Development and Support: Colleen A. Riley

The College of Engineering includes the following research units:

Center for Space Engineering: Frank J. Redd, Director
International Irrigation Center: Humberto L. Yap-Salinas, Director
Utah Water Research Laboratory: David S. Bowles, Director
Engineering Experiment Station: Alma P. Moser, Director

Interdepartmental research programs under the Engineering Experiment Station are:

Center for Computer Aided Design and Manufacturing
Institute for Natural Systems Engineering
Center of Self-organizing Intelligent Systems
National Center for Design of Molecular Function
Center for Solid Waste Recycling
Utah Transportation Center
Utah Technology Transfer Center

The College of Engineering has the major involvement in:
Utah State University Research Foundation: Bartell C. Jensen, President and CEO
Space Dymanics Lab: Allan J. Steed, Director
Space Science Division: James C. Ulwick, Director, Kay D. Baker, Associate Director
Technical Resources Lab: Gene L. Mortensen, Director

The College of Engineering includes the following academic departments:

Biological and Irrigation Engineering
Civil and Environmental Engineering
Electrical and Computer Engineering
Industrial Technology and Education
Mechanical and Aerospace Engineering

The BS, ME, MS, and PhD degrees are offered within specific majors. The various departments are nationally recognized for their instructional and research programs. Recent examples of note include scientific experiments of both faculty and students carried aboard the space shuttle and major equipment grants from industry to establish modern computer workstation laboratories and a computer integrated manufacturing (CIM) facility. Engineering seniors continually rank very high nationally in the Fundamentals of Engineering exam which is required for professional engineering registration. Graduates from the college hold prominent positions within industry, education, and government.

The undergraduate engineering programs offered by USU which are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET) are: Biological Engineering, Civil Engineering, Electrical Engineering, Manufacturing Engineering, and Mechanical Engineering.

The Industrial Technology and Education Department offers the BS in Industrial Technology or Industrial Teacher Education, and the Master of Science in Industrial Education. Associate of Applied Science (AAS) degrees are available in aeronautics and drafting.

For details of the various majors and specialties offered by the above departments, see the respective departmental sections in this catalog.

Objectives

The purposes of the college are (1) to provide students with professional competence which will enable them to enter and progress rapidly in their professional careers, (2) to provide an understanding of the physical and social world in which they live, and (3) to provide a basis for continued intellectual growth, professionally and socially.

In the engineering programs, the curricula begin with studies in mathematics, basic science, introduction to engineering, and an introduction to engineering design. These basic science and engineering skills are coupled with communication skills, and humanities and social sciences. The professional engineering programs continue with engineering science, engineering design, and computer utilization. Engineering design activities progress in depth during the junior and senior years as the student's proficiency increases. The design experience culminates with a major course, which builds upon the fundamentals of engineering, communication skills, science, mathematics, humanities and social sciences, economics, ethics, safety, reliability, aesthetics, and social impact.

The overriding goals of the professional engineering programs are: (1) to unite engineering sciences and computer skills with engineering design to enhance the practical problem-solving abilities, decision-making proficiency, and creativity of the engineering student; (2) to provide for an understanding and appreciation of professional responsibility and ethics; (3) to expand a sensitivity to the economic, legal, and social dimensions of engineering decisions; and (4) to provide the foundation and help instill a desire for life-long learning.

Industrial Teacher Education prepares and qualifies graduates to teach industrial and technical education in the secondary schools. In addition, a highly specialized program prepares teachers for post-high school technical college teaching.

The Industrial Technology program provides both general education and specialized training to qualify graduates for high-level technical and supervisory positions in industry.

See Industrial Technology and Education listing in this catalog for details on admission, academic requirements, and General Education for Technology majors.

Admission

Engineering Requirements. In addition to the policies of the University concerning admission of students, the following regulations apply to the College of Engineering:

1. In order to complete an engineering curriculum in four years, high school students must complete at least two years of algebra, one year of geometry, one-half year of trigonometry, four years of English, and courses in computers, chemistry, and physics. If these courses are not taken in high school, they must be taken in college prior to starting the regular engineering programs. Students with deficiencies in several areas will probably require five years to complete graduation requirements.

Students can earn university credits in English, humanities, and social sciences by receiving appropriate scores on the College Level Examination Program (CLEP) tests. Advanced placement (AP) credit may be obtained in Calculus, Chemistry, Computer Science, English, History, and Physics.

2. Transfer students from other colleges or universities will be referred to the College of Engineering Admission Committee for evaluation. Criteria considered in admission decisions for transfer students include resources available in the requested department and the transfer GPA, along with an evaluation of the program of the former college or university. Decisions concerning academic standing once the student is admitted to USU will be based solely on USU grades.

3. Students who are registered on campus (including General Registration) must be approved by the College of Engineering Admission Committee before transferring to the College of Engineering. Students in this category must have demonstrated by courses taken at USU a potential to succeed in the major of their choice.

Professional Engineering Program

Introduction. The purpose of the Professional Engineering Program (PEP) is to provide a quality education for engineering students by requiring that students be fully prepared for upper-division engineering coursework by having satisfactorily completed all required preprofessional courses; and by limiting enrollment in upper-division courses consistent with resources available within the departments and the college.

Policy. Enrollment in upper-division engineering courses (300-level and above) is available only to students who have been accepted into the PEP or an appropriate graduate program or have a nonengineering major which requires a specific engineering class.

Application Requirements. Current PEP applications listing the required PEP courses and admission standards are available from the various departments and the office of the Dean of Engineering. The minimum requirements a student must satisfy in order to be eligible to apply for admission to a professional program are:

1. The student must be in good academic standing in the University and the college.

2. The student must achieve a grade of *C-* or better in every required preprofessional course. The *P/D+, D, F* grading option may not be used except in freshman English composition.

3. The student must achieve an overall grade point average of 2.3 or better for all required preprofessional coursework completed at USU.

Repeated Coursework. A student can repeat no more than three of the required preprofessional courses in order to satisfy the PEP application and eligibility requirements. Multiple repeats of the same course are included in the total of three repeats. Audits count as a time taking a class unless prior written approval is obtained from the college academic adviser.

Transfer Credit. Transfer credit accepted by the department and the college may be applied toward meeting the requirements for admission into the PEP; however, the grades received will not be used in the USU GPA calculation. For students with transfer credits, a final decision on admission into the PEP will not be made until after the applicant has completed at least 15 credits of acceptable engineering, math, and science coursework at USU. Some of this coursework may include upper-division classes taken by permission.

Applications. Students should apply to the Professional Program midway through the quarter in which they will complete all preprofessional courses. Students may request permission to take a limited number (not to exceed 15 credits) of upper-division courses if they are within 10 credit hours of completing the necessary requirements, have submitted a PEP application, and are registered for all remaining preprofessional courses. The final decision on granting permission to take upper-division classes before admission to the PEP rests with the appropriate department head and the Dean of Engineering.

Admission Procedures. Satisfying minimum eligibility requirements does not ensure that a student will be admitted to a PEP program in a specific department. The number of students accepted into the Professional Engineering Program of a department will be based upon the number of students that can be accommodated in upper-division classes. Applicants will be ranked and selected in order of their academic standing in the required preprofessional courses. Admission into a PEP program is for a period of three years. Students unable to complete graduation requirements during this time will be interviewed by the department head to determine whether special circumstances justify their continuance in the program.

Academic Requirements

The Dean's Office of the College of Engineering maintains a handout sheet giving current details of all academic regulations of the college. **It is the responsibility of the student to know the current regulations and to follow these regulations.**

Preprofessional Program. Students must maintain a USU GPA of 2.0 to remain in good standing both in the college and the University. Students in a preprofessional program who are not making satisfactory progress toward acceptance into a professional program or who become ineligible to enter a professional program will be suspended from the college. Students in good standing in a preprofessional program must still meet the entrance requirements for admission into a professional program.

Professional Program. For all engineering majors in the professional program the following academic regulations apply in addition to University regulations:

1. A GPA of 2.0 or higher must be maintained in all engineering/math/science courses required for, or used as technical electives in, the chosen major. Courses which were part of the preprofessional program requirements and general education courses are not included in this GPA calculation.

2. No more than 10 hours of *D* or *D+* credit may be applied toward meeting graduation requirements in engineering/math/science classes.

3. College of Engineering courses may be repeated only once. Audits count as a time taking a class unless prior written approval is obtained from the department head. A maximum of three required or elective courses completed as part of a professional program can be repeated in order to meet graduation requirements. (Courses completed as part of a preprofessional program are not included in this total of three repeats.)

4. The *P/D+, D, F* grading option may not be used in required or elective courses completed as part of a professional program. (The *P/D+, D, F* grading option is approved for General Education Courses.)

5. The academic regulations listed above (1-4) apply to required coursework and any elective engineering/math/science course which could be used to satisfy graduation requirements for the chosen degree. That is, once a student completes a particular technical elective, it becomes a required course for that student.

6. Students in violation of departmental or college academic regulations, no longer eligible for graduation, or not making satisfactory progress toward a degree, will be placed on probation.

a. Students will be placed on probation if they (i) earn an *F* in an engineering/math/science course which could be used to satisfy graduation requirements for the chosen degree (see No. 5 above); (ii) have more than 10 hours of *D* credit (see No. 2 above); or (iii) have a GPA of less than 2.0 (see No. 1 above).

b. Students remain on probation until they improve their standing by repeating and passing all failed classes, repeating classes to reduce the number of *D* credits to 10 or less, and/or by raising their GPA above 2.0.

c. While on probation, a student must earn a quarterly GPA of 2.0 or higher in engineering/math/science classes and must not earn any *D*'s or *F*'s.

While on probation, a student may not preregister. The student's major code will be changed to a preprofessional code. The student must meet at least quarterly with the college academic

adviser to work out a schedule having the primary goal of correcting the existing academic problems.

General Education

Studies in the humanities and social sciences serve not only to meet the objectives of a broad education, but also to meet the objectives of the engineering profession. In the interest of making engineers fully aware of their social responsibilities and better able to consider related factors in the decision making process, the College of Engineering requires coursework in the humanities and social sciences as an integral part of the engineering program. To satisfy this requirement, courses selected must provide both breadth and depth and be planned to fulfill an objective appropriate to the engineering profession.

General Education requirements in the College of Engineering are more restrictive than University requirements. Students must meet the engineering requirements and must also satisfy the University requirements. Engineering students should obtain detailed information concerning General Education from the college academic adviser.

General Engineering

Engineering students are encouraged to select a major as soon as possible. Most of the courses taken during the freshman year are common to all engineering majors; however, there are significant differences in the courses taken during the sophomore year. Students who have not selected a specific major should meet with the college academic adviser for assistance in planning a personalized program. Students who choose to remain in general engineering must be prepared to meet the specific requirements of a professional program in the department of their choice. Detailed course requirements for admission into the professional programs are given in the departmental sections of this catalog.

Common General Engineering Program

Freshman year: Engr 187, 188; Math 220, 221, 222; Chem 121, 122, 124; Phyx 221; Engl 101 or 111; General Education (6-9 credits); engineering courses (6-9 credits); Computer Science (0-4 credits). Total credits, 46-49.

Sophomore year: Math 320, 321, 322; Phyx 222; Engr 200, 202; Engl 201; Electrical Engineering (3-4 credits); General Education (3-10 credits); engineering courses (9-15 credits); Computer Science (0-7 credits). Total credits, 48-54.

General Engineering Courses

PS 101. Introduction to Engineering. Introduction to engineering with basic problems and solutions. Course structured for the nonengineering student. Prerequisites: some trigonometry or instructor's permission. (2)

103. Digital Computer Utilization. Introduction to computer programming and the use of digital computers in engineering problem solving and data processing. Prerequisite: Math 220. (3F,W,Sp)

187, 188. Engineering Orientation and Computer Applications. Orients students to College of Engineering programs, academic advising, student services, professional societies, and engineering careers. Laboratory activities emphasize writing and computer applications. Prerequisites: Math 106 and keyboarding at 25 WPM. (1F,W) (1W,Sp)

200. Engineering Mechanics Statics. Resultants and equilibrium of force systems, friction centroids, moments of inertia, method of work. Should be taken concurrently with Math 222. Prerequisites: Math 221, Phyx 221 (recommended). (3F,W,Sp,Su)

202. Engineering Mechanics Dynamics. Kinematics, and force-mass-acceleration. Prerequisites: Engr 200, Math 222. (3F,W,Sp)

203. Engineering Mechanics Dynamics. Work-kinetic energy, impulse momentum, and vibrations. Prerequisite: Engr 202. (3F,W,Sp)

204. Mechanics of Solids. Stress, strain, and deflection due to tension, compression, and torsion. Mohr's circle for stress and strain. Prerequisite: Engr 200. (3F,W,Sp)

293. Special Problems. Independent or group student study of engineering problems not covered in regular course offerings. (1-15F,W,Sp,Su) ®

IO 320. Technology and Human Values. Social impacts of information and technology; professional activities and ethical behavior; computer legislation and crimes; conflicts of interest; privacy, confidentiality, and right-to-know issues; obligations to employers, clients, and society. Emphasis on case studies. (3)

330. Thermodynamics. First and second laws of thermodynamics. Prerequisite: Math 322. (3F,Sp,Su)

Additional Engineering Information

Professional Societies. Faculty members of the departments hold memberships in various professional societies and organizations.

Student chapters or societies include Society for Engineering in Agricultural, Food, and Biological Systems, American Institute of Aeronautics and Astronautics, American Society of Civil Engineers, Chi Epsilon, Institute of Electrical and Electronic Engineers, Society of Manufacturing Engineers, American Society of Mechanical Engineers, American Water Resources Association, Tau Beta Pi, International Technology Education Association, National Intercollegiate Flying Association, Professional Flight Society, American Welding Society, Society of Environmental Engineering Students, and Society of Women Engineers. Students are encouraged to affiliate with appropriate student societies.

The Engineering Council is comprised of a student from each department and a staff member from the Dean's Office. The college senator is chairperson. The council meets regularly to provide effective student-staff-administration liaison.

ROTC. Many engineering students find satisfaction in serving their country in the Reserve Officers Training Program (ROTC) and as reserve officers after graduation. Junior and senior ROTC students receive compensation equivalent to a substantial scholarship. See Military Science and Aerospace Studies department listings.

Scholarships, Fellowships, and Assistantships. A number of scholarships and assistantships are available to College of Engineering students. Interested high school seniors are encouraged to write to the High School/College Relations Office of the University before February 28 of the year they wish to receive assistance. Continuing students, transfer students, and returning students should contact the Dean's Office, College of Engineering for a scholarship application. Completed applications are always due by March 1. See Awards, Honors, Scholarships, and Grants-in-aid section of this catalog. There are also opportunities for employment on research projects and other activities.

Graduate Assistantships and Fellowships. Excellent graduate assistantships, fellowships, and scholarships are available in all departments. Assistantships are available both for teaching and research. Applications should be made directly to the department concerned.

Interdepartmental Curriculum in Environmental Engineering. The Interdepartmental Curriculum in Environmental Engineering is an interdisciplinary graduate level program. A student who has decided upon a career in environmental engineering will find it advantageous to contact the Environmental Engineering Division within the Civil and Environmental Engineering Department at the earliest opportunity to plan a program that will prepare him or her to enter the graduate program for the fifth year of engineering education. (See *Graduate Catalog* for details).

Research. The College of Engineering maintains an extensive program of research through the Engineering Experiment Station and the various departments and laboratories. There are opportunities for graduate students to participate, and many undergraduates can find employment in research programs.

USU Research Foundation. The research laboratories which comprise the USU Research Foundation are located near the USU campus at Logan and at Bedford, Massachusetts. The faculty members of these laboratories hold academic appointments as appropriate in the Electrical and Computer Engineering, Mechanical and Aerospace Engineering, and Physics Departments, and working assistantships are available for good undergraduate and graduate students in these and closely related departments. The faculty and staff specialize in upper atmospheric and space measurements using electro-optical and electrodynamical instrumentation flown on rockets, satellites, aircraft, and balloons. A recent project flew a cryogenically cooled interferometer spectrometer aboard the space shuttle.

International Irrigation Center. The International Irrigation Center conducts an extensive program of irrigation training and technology transfer through multi-lingual courses and through research. The center contributes significantly to improved irrigation practice, water management, and food production through these activities.

Utah Water Research Laboratory. The Utah Water Research Laboratory offers facilities and student support for water research, including surface and ground water resources management and use. Strong programs have been developed through multiple projects in weather modification, water quality control, waste water treatment, hydraulics, flood and erosion control, hydrology, groundwater modeling, salinity control, water use in energy development, water systems optimization, and the socioeconomic aspects of water resources planning. Studies are coordinated with academic programs in the Departments of Civil and Environmental Engineering, Biological and Irrigation Engineering, and related departments in other colleges.

Engineering Experiment Station. The Engineering Experiment Station furthers engineering science, education, and practice through a variety of research programs to serve the needs of Utah and the nation. The experiment station especially encourages the development of interdisciplinary, interdepartmental research. Major activities are currently underway in the Center for Computer Aided Design and Manufacturing, Institute for Natural Systems Engineering, Center for Solid Waste Recycling, Center of Intelligent Self-organizing Control, National Center for Design of Molecular Function, and Utah Transportation Center.

Graduate Study. The college offers graduate study programs leading to the ME, MES, MS, CE, and PhD degrees. For further information and details, see the *Graduate Catalog*.

College of
Family Life

Dean: Bonita W. Wyse
Office in Family Life 203B, 797-1536

Acting Associate Dean for Extension: Leona K. Hawks

The College of Family Life has the following departments and areas of specialization:

Family and Human Development
- Family and Human Development, with emphases in
  - Human Development
  - Marriage and Family Relationships
- Early Childhood Education[1]

General Family Life[2]

Human Environments: Apparel Merchandising, Interior Design, Consumer Sciences, and Family and Consumer Sciences Education
- Family and Consumer Sciences Education
- Apparel Merchandising
- Interior Design

Nutrition and Food Sciences[3]
- Nutrition and Food Sciences, with emphases in Food Science, Dietetics, Nutrition Science, and Culinary Arts/Food Service Management

Objectives

The College of Family Life views the family as the major source of nurturance, protection, and support for the individual. The basic mission of the College of Family Life is to improve the quality of human life in the context of family living, through maximizing communication of relevant knowledge via teaching, research, extension, and other outreach programs.

Programs in the College of Family Life are designed to achieve three objectives:

1. to prepare professionals to assume leadership and service roles in society by preparing them for careers in community agencies, teaching, industry, and business.

2. to provide quality community services to families.

3. to provide relevant general education for all University students and the community.

Degrees

Degrees offered in the College of Family Life include the Bachelor of Science (BS), Bachelor of Arts (BA), Master of Science (MS), Doctor of Philosophy (PhD) in Nutrition and Food Sciences, and PhD in Family Life. The Family Life PhD can be earned with a specialization in Family and Human Development or Human Environments.

[1]Jointly administered with the Department of Elementary Education in the College of Education.

[2]An interdepartmental major administered by the Department of Human Environments.

[3]Jointly administered with the College of Agriculture.

Admission Requirements

Students accepted in good standing by the University are eligible for admission to the College of Family Life.

Academic Requirements

In addition to the University requirement of 40 credits of General Education, the College of Family Life requires 9 credits of written communication. This requirement may be filled by completing Engl 101 or 111; Engl 200 or 201; and Engl 301 or 305. The 100-level requirement is waived if the student scores 25 or higher on the English section of the ACT Exam, receives a 3 or higher on the English Advanced Placement Exam, or scores 610 or higher on the English section of the CLEP Test.

Academic requirements vary as a function of each department's standards and policies. It is the responsibility of the student to be informed about departmental requirements and regulations. For complete information, consult with departmental adviser.

A 2.5 grade point average is required for the majors in Human Environments and in Nutrition and Food Sciences. The Family and Human Development Major requires a 2.67 GPA and the Early Childhood Education Major requires a 2.75 GPA. A 2.0 overall grade point average, consistent with the University requirement for graduation, is required by the college.

Pass/D+,D,F option may not be used in major courses or in supporting courses, unless authorized by departments.

The number of credits required for a major will be specified by area of concentration, subject to minimum University requirements.

To provide a common base of understanding, all majors in the College of Family Life will complete 13-15 credits (depending upon the choices made) selected from the following groups of courses:

Required Courses

1. Roles and interrelationships of families (1 of 3): FHD 120, 150, or 304.

2. Management and decision making in family development and daily living (1 of 3): HEnv 255, 349, or 355.

3. Aesthetic qualities of the environment (1 of 3): HEnv 105, 215, 265.

4. Nutrition in human growth and development (1 of 3): NFS 122, 222, or 440.

5. Develop an understanding of the interdisciplinary nature of the college and its programs. Required course: FL 110.

General Family Life Major

The General Family Life major offers **two options**. The purpose is to permit flexibility and allow students to have input into the design of their major within the following context areas: Consumer Sciences, Clothing and Merchandising, Interior Design, Family and Human Development, and Nutrition and Food Sciences.

Option 1 encourages majors to select courses in one or two subject matter areas related to Family Life, such as housing or financial planning. This option promotes depth in subject matter

areas and prepares majors to become specialists. A 15 credit, one quarter internship, which coordinates with one of the subject matter concentrations, is required.

Option 2 encourages breadth and requires majors to include a minimum of 9 credits in each of the subject matter areas for a more general degree. Completion of an internship is recommended.

General Family Life majors are encouraged to select a minor in a supporting field, such as journalism, business, or sociology, to enhance their skills for a variety of positions that contribute to the health and well-being of individuals and families.

Graduate Study

All departments within the College of Family Life offer a graduate program. See the *Graduate Catalog* for more detailed information.

Family Life Course

110. College of Family Life Orientation. Provides an understanding of the interdisciplinary nature of the college, its programs, and its faculty. (1W)

College of
Humanities, Arts and Social Sciences

Dean: Brian L. Pitcher, Office in Library 216, 797-1200
Associate Dean—Academics: Joyce A. Kinkead, 797-1706
Associate Dean—Administrative Affairs: R. Edward Glatfelter, 797-1196
Associate Dean—Extension: David L. Rogers, 797-1255
Director, Center for International Studies: Yun Kim, 797-1231
Director, Liberal Arts and Sciences Program: Ann Leffler, Office in Library 224, 797-2039
Director, Science/HASS Advising Center: Mary E. Leavitt, Office in Student Center 304, 797-3883
Supervisor, College Graduation and Academic Services: Jennifer W. Tingey, Office in Student Center 304, 797-4029
Study Abroad Program: Office in Student Center 304, 797-0601

The College of Humanities, Arts and Social Sciences has the following departments and programs:

Aerospace Studies
Art
Asian Studies
Communication
English
History
Intensive English Language Institute
Landscape Architecture and Environmental Planning
Languages and Philosophy
Liberal Arts and Sciences Program[1]
Military Science
Music
Political Science
Sociology, Social Work and Anthropology
Theatre Arts
Undeclared

A listing of majors and degrees can be found under each department or program.

Within the College of Humanities, Arts and Social Sciences are found those departments which provide career preparation in some of the most interesting and vital academic fields. The study of society, the governing of society and its history, communication in a number of languages, the various aspects of culture—all these appeal to an increasing number of undergraduate and graduate students. Many train for careers in these fields; more—scientists, engineers, etc.—take courses to broaden their horizons and add interest to their lives.

It is probably fair to say that the social trend is toward an awareness that while material things are important they are not enough for a full life. For this, the individual may turn to literature, art, music, and theatre. Concern with environmental problems may lead the student to an investigation of landscape architecture. The complexities of modern life necessitate an understanding of the social sciences and history. It is within the College of Humanities, Arts and Social Sciences that these needs may be met.

Admission and Graduation Requirements

Students accepted in good standing by the University are eligible for admission to the College of Humanities, Arts and Social Sciences. Because of limitations of faculty and/or space, a few departments within the college, such as Art, LAEP, and Sociology, Social Work and Anthropology, limit enrollment in their professional programs. See the departmental sections in the catalog and the department head for information regarding these limitations and/or requirements in addition to the University graduation requirements.

Undeclared

Coordinator: Mary E. Leavitt
Office in Student Center 304, 797-3883

The chief function of the Undeclared program is the advisement of students who have not yet decided upon a major or area of specialization. Students in the Undeclared program typically work on their general education requirements while exploring major options. This allows them to make progress towards overall degree requirements and provides them with extra time to make wise, informed decisions. Undeclared students are advised by counselors in the Science/HASS Advising Center until they choose a major.

Students who are enrolled in another department but feel they have chosen their major unwisely may transfer to the Undeclared program upon receiving permission from the dean of the College of Humanities, Arts and Social Sciences.

[1]Jointly administered with the College of Science.

No degree is offered through the Undeclared program. Most Undeclared students are freshmen or sophomores. Typically, by the junior year, most students have selected a major and are involved in taking major courses. Students do not usually remain in the Undeclared program beyond 90 credit hours or past the end of the sophomore year.

Women's Studies

Program Coordination: College of Humanities, Arts and Social Sciences
Contact: Pamela J. Riley, director, Main 224G, 797-1256 or 797-7006; e-mail: priley@wpo.hass.usu.edu

The Women's Studies program is multidisciplinary and focuses on the changing roles of women and men in society. It provides the individual student an opportunity to become academically involved in a program which deals with the socialization and gender roles of adults together with analyses of these roles and changes from early childhood. The program also emphasizes the contributions of women in the past, during the present, and toward the future. By providing insight into the effects of changing role patterns on both men and women, the Women's Studies program prepares students to better cope with current and future changes and to become an influential force in the shaping of those changes.

A number of Women's Studies courses are being taught by faculty members in departments throughout the campus each quarter, and more courses are being developed to meet the current and future needs of the program.

Students may enroll in individual courses or apply coursework toward either a minor in Women's Studies or an Area Studies certificate. Further information may be obtained from the director, the program brochure, or the Science/HASS Advising Center (Student Center 304).

Minor in Women's Studies. Students may obtain a minor in Women's Studies by completing a total of 18 credits in the field. HEnv/Soc 238 is the only required course.

Mountain West Center for Regional Studies

Director: F. Ross Peterson
Associate Director: Shannon R. Hoskins
Office in Main 303, 797-3630

The Mountain West Center for Regional Studies gathers scholars, departments, and resources of Utah State University to facilitate an interdisciplinary approach to regional studies. The center is founded on three assumptions: that the humanities are essential to the fulfillment of the University's mission, that regional studies make possible a better understanding of the values and assumptions that shape society, and that such studies are strengthened by communication and cooperation among academic departments.

The center brings together scholars from the areas of history, folklife and folklore, anthropology, art, and literature. It develops programs, administers scholarships, and provides support for research on the Mountain West. It makes possible symposia, publication, interpretation, preservation, public outreach, and graduate student training in the humanities.

The cooperating programs of the center include the David and Beatrice Evans Biography Award, the Fife Folklore Program and Archives, the Nora Eccles Harrison Museum of Art, the Ronald V. Jensen Living Historical Farm, the Merrill Library Special Collections, the Utah History Fair, the Utah State University Anthropology Museum, the Utah State University Press, *Western American Literature*, the *Western Historical Quarterly*, and the Western Writers' Conference.

Science/HASS Advising Center

Director: Mary E. Leavitt
Associate Director: Jennifer W. Tingey
Adviser: Irene B. McInerney
Adviser: Horace N. Stogner, Jr.
Adviser: Lynne M. Slade
Office in Student Center 304, 797-3883

The Science/HASS Advising Center is a campus office designed to provide academic advising for students in the College of Science and the College of Humanities, Arts and Social Sciences. Academic advisers counsel these students in the general education requirements and in the Area Studies Certificate in the Liberal Arts and Sciences program (LASP), a program that may be substituted for the Broadening Knowledge portion of general education (see page 37). The center also advises all other students interested in the LASP option.

Academic advising is provided through the center to all Liberal Arts and Sciences majors. Undeclared students also are advised in the center, with special emphasis on major exploration and career counseling. In addition, the Study Abroad programs, which provide students with opportunities to explore educational pursuits abroad, the USU Area Studies Program, and the College of HASS Cooperative Education and Internship Programs are coordinated through the center.

Additional services include transfer credit analysis and academic services for the College of HASS. Liberal Arts and Sciences majors, Undeclared students, all HASS students, students interested in the LAS certificate, and transfer students are particularly welcome to explore the various services of the center.

Center for International Studies

Director: Yun Kim
Office in Main 224K, 797-1231

The Center for International Studies promotes and coordinates international academic exchanges between the University and institutions of higher education abroad. Major objectives of the center are: (1) to develop bilateral university linkage programs, (2) to facilitate faculty and student exchange programs, and (3) to promote collaborative research programs, joint seminars, workshops, and conferences. The center also serves as the University academic center for international studies curriculum offerings and the Certificate for International Development program.

Study Abroad Program

Office in Student Center 304C, 797-0601

USU offers many exciting and rewarding opportunities for students to study abroad.

Each summer quarter, the Languages and Philosophy Department offers opportunities for language studies abroad. Groups travel to Spain, Aix-en-Provence and Avignon in France, and Freiburg in Germany. A tour to Russia, led by knowledgeable, Russian-speaking language professors, takes place each June.

USU participates in student exchange opportunities in four different locations in Korea, which includes classes taught in English and Intensive Korean. Student exchanges between USU and Kansai Gaidai University near Osaka, Japan offer Asian Studies Classes taught in English and Japanese. Each year up to three outstanding students in the humanities and social sciences are selected to attend Manchester College, Oxford University, England. Through the International Student Exchange Program (ISEP) students have access to more than 100 foreign universities worldwide, including countries in Africa, Asia, the South Pacific, the United Kingdom, Western Europe, Canada, and Latin America. In cooperation with the University of Utah, there is an exciting summer program at Cambridge England.

USU's College of Natural Resources offers its own study abroad program in Mexico, Morocco, and Iceland.

Contact the Study Abroad Office, Student Center 304C, for further information.

Asian Studies Major and Minor

Program Director: Yun Kim (Department of Sociology, Social Work and Anthropology), Main 224K, 797-1231
Co-Program Director: R. Edward Glatfelter (HASS Dean's Office), Library 234, 797-1196

Major. The Asian Studies major requires a minimum of 40 credits approved by the program director. The program must include 14 credits selected from the core courses and 12 credits of Asian Studies electives. The remaining 14 credits should be selected from the general electives, after consultation with the Asian Studies faculty adviser. In addition, 25 credits of an Asian language are required for graduation.

Minor. A minor in Asian Studies requires a minimum of 35 credits, including 14 credits selected from the core courses and 21 credits selected from the courses approved by the Asian Studies program director. In addition, at least 10 credits of an Asian language are recommended.

Core Courses (required minimum of 14 credits): Hist 360; Soc 480 (Seminar on Asian Society); Econ 580; Geog 520 (when topic covered concerns Asia); PolS 323, 425, 426.

Asian Studies Electives (minimum of 12 credits required for major): Hist 361, 362, 367, 368, 369; Phil 488 (Philosophies of the Far East); PolS 424, 447; Soc 480 (Women in Asia); Engl 533 (when syllabus includes Asian literature).

General Electives. For a listing of general electives, consult the Asian Studies program brochure.

Asian Languages. For listings of Asian language courses, see the section for the Department of Languages and Philosophy in this catalog (pages 176-181).

Minor in Classics

Coordination: Mark L. Damen and Frances B. Titchener, Department of History
Office in Main 323, 797-1290

An academic minor is available in the field of **Classical Studies** with three areas of emphasis: **Classical Civilization, Latin Language,** and **Greek Language.** From the ancient civilizations of the Mediterranean area are derived our government, literature, sciences, and laws. The classical world is the backdrop of the modern world. In association with various majors, the Classics Minor is designed to enhance intellectual abilities and practical skills.

Requirements for the three emphasis areas are as follows:

Classical Civilization: At least 31 credits from an approved list of courses.

Latin Language: 10 credits in upper-division Latin (300-level or above), plus 8 credits from an approved list of courses.

Greek Language: 10 credits in upper-division Greek (300-level or above), plus 8 credits from an approved list of courses.

Approved courses for the various minors are listed in the brochure titled *Classical Studies*. Brochures are available from the Department of History, Main 323.

Minor in International Development

An academic minor is available in the field of International Development. Eighteen credit hours are required. They include 11 credits of core courses and seven credits of elective courses. Core courses consist of one specified course each from the Economics, Political Science, and Sociology course listings. Elective courses may be selected from a geographical area of interest or from a wide range of related fields. This minor is very flexible and is a useful preparatory tool for development work. Although a foreign language is not required for the minor, it is strongly recommended that a student who is seriously considering working abroad have capability in a foreign language.

Approved courses and academic advisers for the minor in International Development are listed in the brochure titled *Area Studies in International Development*. Courses must be approved by an area studies adviser. **Brochures are available in SC 304.**

Humanities, Arts and Social Sciences Courses

The College of Humanities, Arts and Social Sciences offers interdisciplinary courses which combine the humanities, arts, and social sciences and which are team taught, drawing faculty from among the departments of the college.

125. Interdisciplinary Workshop. (1-6)

129. Women's Studies: Special Topics. An interdisciplinary course to present current issues and topics in Women's Studies. (1-9) ®

225. Introductory Internship/Co-op. Introductory level educational work experience in an internship/cooperative education position approved by the departments in the College of Humanities, Arts and Social Sciences. (1-6) ®

425. Advanced Internship/Co-op. Internship/cooperative education work experience; increased complexity and a more professional level of experience as a student advances toward completion of the program. (1-15) ®

480H. Honors Senior Seminar. Oral presentations and discussion of senior thesis projects and some guest presentations on ways of knowing among various academic specialties. (3Sp) ®

481H. Senior Seminar. For students in HASS to explore an honors interdisciplinary theme selected by the College Honors Committee as a culmination of a departmental honors experience. (3Sp) ®

491. Study Abroad. A quarter study abroad experience through a student exchange program. Approval required from the Office of Study Abroad. (1-30F,W,Sp)

497H. Senior Thesis. A student-initiated research project under faculty supervision. Prerequisites: satisfactory GPA, instructor recommendation, and approval of departmental honors coordinator. (1-9F,W,Sp,Su)

525. Interdisciplinary Workshop. (1-6)

529. Women's Studies: Special Topics. An interdisciplinary course to present current issues and topics in Women's Studies. (1-9) ®

625. Graduate Internship/Co-op. (1-15) ®

College of
Natural Resources

Dean: Joseph A. Chapman
Office in Natural Resources 108, 797-2445

Associate Dean: Frederic H. Wagner
Assistant Dean (Academic): John A. Kadlec
Assistant Dean (International): Derrick J. Thom
Academic Services Adviser: Maureen A. Wagner

Academic Departments. The College of Natural Resources has the following academic degree programs and undergraduate majors:

Fisheries and Wildlife Department
Fisheries and Wildlife (BS)
Forest Resources Department
Environmental Studies (BS)
Forestry (BS)
Recreation Resource Management (BS)
Geography and Earth Resources Department
Geography (BA or BS)
Rangeland Resources Department
Range Science (BS)
Watershed Science Unit
Watershed Science (BS)

A list of degree requirements and areas of emphasis can be found in the catalog section for each department.

Interdisciplinary Programs. Many of the degree programs listed above are interdisciplinary to some extent. However, both the Environmental Studies and Watershed Science programs offer students the opportunity to develop broad interdisciplinary programs to meet their interests. Watershed Science builds on a strong science base; Environmental Studies has a greater emphasis on management and policy.

Minors in Natural Resources. The college offers minors in the following areas:

Environmental Studies
Fisheries and Wildlife
Geography/Geography Education
Range Science
Recreation Resources
Watershed Science

Requirements for the minors are found in the appropriate departmental sections of this catalog. Students should also consult a faculty adviser for the minor.

Objectives

The College of Natural Resources provides programs of study and professional training in the use and management of natural resources and the environment. These programs deal with renewable land and water resources and the management of these resources and their ecosystems. Forests, rangelands, wildlife, fisheries, watersheds, and recreation resources comprise the natural resources and environmental areas in which the college has developed professional competence. The college's expertise in geography provides a link between the management of these resources and their value to our society and other cultures.

The College of Natural Resources programs and facilities provide exceptional opportunities for field experience. Forests and rangelands comprise more than 90 percent of the total Utah land area. The Wasatch-Cache National Forest and other areas of natural lands close to the USU campus provide unlimited study projects and opportunities for demonstration. Yellowstone and other national parks are within one day's driving distance.

Career Opportunities. The curricula of the college prepare men and women for positions with federal or state agencies, private-sector work in natural resources management and administration, and positions in education.

Summer Camp. Field instruction at the college-operated summer camp is open to all natural resources majors and is required of students majoring in the range management option in the Rangeland Resources Department or the forestry and recreation resource management curricula in the Forest Resources Department. Summer camp is normally attended at the end of the sophomore year. Students applying for admission to summer camp should have completed college-level biology and algebra and have a 2.5 GPA in College of Natural Resources courses.

The thirteen-credit camp begins a week after commencement and continues for six weeks. In addition to the regular summer

quarter tuition and fees, several classes require lab fees. Board is provided on a cost basis; lodging is without cost.

Summer Employment/Work Experience. Students are strongly encouraged to seek summer employment with faculty research projects or natural resource agencies to gain practical work experience and help refine career goals. Students should check with the College of Natural Resources dean's office in early January regarding summer employment opportunities.

Academic Policies

Admission. Freshmen accepted in good standing by the University are eligible for admission to the College of Natural Resources. Transfer students need a cumulative 2.5 GPA for admission to College of Natural Resources majors. Departments may impose additional requirements; refer to departmental sections for information.

Students will make more satisfactory progress in natural resources majors if they have had two years of high school algebra and coursework in geometry, chemistry, physics, biology, and keyboarding. Four years of English are also desirable. Prospective students should realize that natural resources fields are highly technical professions, requiring not just field ability, but also high aptitude for scholarship. Success is also correlated with an ability to work well with people.

Natural Resources—Undeclared. Students who have not yet decided on a specific natural resources major may be admitted to the college as undeclared. Most of the courses taken during the freshman year are common to all natural resources majors; however, students are encouraged to select a major as soon as possible. Students in the undeclared category should meet with the college academic adviser for assistance in planning their educational program and selecting a major.

Stop-Out Policy. Students who have a break in their educational experience in excess of one year will be subject to the college and departmental requirements in effect at the time of their return. Students attending continuously have the option of completing their degree under the requirements in effect at the time of their admission to the major or changing to a revised program adopted any year while in the major (but not a combination of the two).

Academic Responsibility. The departments publish current major requirement sheets each year. It is the student's responsibility to know the current requirements and to consult with a faculty adviser in planning and completing his or her degree program.

Graduation Requirements. Students must satisfy all University, college, and departmental major requirements for graduation. This includes a 2.5 GPA in all courses taught by the College of Natural Resources. Refer to appropriate sections of this catalog for further details on graduation requirements.

Professional Organizations

Students are strongly encouraged to participate in professional organizations affiliated with their major. The College of Natural Resources has student chapters of the following professional societies:

American Fisheries Society
Gamma Theta Upsilon (Honorary Geography Society)
National Association of Environmental Professionals
Society of American Foresters
Society for Range Management
The Wildlife Society

Financial Aid

Scholarships. A number of scholarships are available to students in the college. The S. J. and Jessie E. Quinney scholars program offers ten four-year, $1,000 scholarships to entering and transfer undergraduate students in the College of Natural Resources each year. There are also many $200-$1,800/year scholarships for continuing students.

Interested high school seniors and transfer students are encouraged to write to the dean's office regarding these scholarships. Also, see the scholarship section of this catalog.

Loan Funds. Several sources of funds are available on a loan basis to worthy upper-division students in the College of Natural Resources. Loans are made for short periods. Application should be made through the dean's office.

Research

The College of Natural Resources maintains an extensive program of research through its academic departments and the affiliated Jack H. Berryman Institute, Center for Disturbance Ecology, USDA/APHIS Predator Project, USDA Aquatic Ecosystem Monitoring Center, Utah Cooperative Fish and Wildlife Research Unit, and USU Ecology Center. Part-time employment opportunities are often available for undergraduates in college research programs.

Graduate Study

The college offers graduate study programs leading to the MS, MA, MF, and PhD degrees. See the *Graduate Catalog* for further information and details.

Natural Resources Courses

The College offers the following interdepartmental courses tying together basic concepts, problems, and purposes in the various natural resource fields:

IO 101. Natural Resources and the Future. Introduction to human populations and impacts on our environment, and how basic ecological, economic, or natural resource management concepts can help solve environmental problems. (3F,Sp)

102. Natural Resources and the Future—Discussion Session. This course is the discussion session for NR 101 and is optional for all but Natural Resources majors; not recommended for General Education Integrative Option students. (1F,Sp)

201. Computer Techniques. In a "user friendly" manner, shows students how to use a variety of computer hardware and software features that are necessary for upper-division natural resources courses. Prerequisite: Math 105. (4W,Sp)

360. Quantitative Methods for Natural Resource Management I. Review, application, and extension of quantitative skills into natural resource management areas. Prerequisites: Math 105; Stat 201 or equivalent; NR 201 or equivalent. (4F,W)

370. Quantitative Methods for Natural Resource Management II. Application of quantitative methods to problem-solving in natural resources inventory, assessment, management, and research. Prerequisite: NR 360. (4W,Sp)

380. Natural Resource Management. Problem identification, problem solving, planning, and decision-making presented in the context of the land manager. Theory, quantitative analysis, and application to natural resource management situations. Recommended: NR 360. (4W)

390. Natural Resource Policy. Politics of policy process for natural resources, from agenda setting to implementation; current resource issues and unique aspects of policy making for natural resources. (4W,Sp)

491. Natural Resources Study Abroad Internship. For students participating in the College of Natural Resources undergraduate study abroad program. (1-20F,W,Sp,Su)

501. Natural Resources for Teachers. Field course designed to acquaint teachers with natural resource issues, teaching methods, and materials. (2-4Su) ®

511 (d611).[1] Environmental Education. Acquaints students with the nature of our natural resources, principles for intelligent stewardship, and procedures for incorporating this knowledge into learning situations. (4Sp)

576. Modeling Biological Systems. Introduction to mathematical and computer modeling of biological systems, emphasizing ecological systems. Prerequisites: Math 216 or 221, at least one upper-division course in Natural Resources or Biology, Stat 201, and computer programming or permission of instructor. Three lectures, one recitation. (4F)

577. Modeling Forest Dynamics. Theory and methods of forest succession modeling. Analysis and construction of tree and forest ecosystem simulation models. Emphasis on methods and application. Prerequisites: Biol 386, Math 215, Stat 301, and CS 241. (3Sp)

Graduate[2]

601. Directed Teaching in Natural Resources. (1-5F,W,Sp,Su)

611 (d511). Environmental Education. (4Sp)

643. Natural Resource and Environmental Policy Cornerstone Seminar. (3Sp)

644. Natural Resource and Environmental Policy Seminar Series. (1Sp)

645. Natural Resource and Environmental Policy Presentation. (1Sp)

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[1]Parenthetical numbers preceded by a *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

College of
Science

Dean: James A. MacMahon
Office in Science Engineering Research 101, 797-2478

Associate Dean: Antone H. Bringhurst
Assistant Dean for Undergraduate Affairs: Kandy Baumgardner
Development Director: Katherine Angelos

The College of Science has the following departments and programs:

Biology
Chemistry and Biochemistry
Computer Science
Geology
Liberal Arts and Sciences Program[1]
Mathematics and Statistics
Physics
Cooperative Nursing Program

Degrees, areas of specialization, and program descriptions are listed with the departments and the Nursing Program. In addition, there is a Center for Atmospheric and Space Sciences (CASS) and three interdisciplinary programs which involve the college. There is a separate listing describing the activities of CASS on page 262. The Program in Molecular Biology consolidates and provides emphasis for research and teaching related to molecules in biological systems. Students in the college majoring in Biology or Biochemistry can receive advanced degrees with a biology/molecular biology or biochemistry/molecular biology emphasis. The Department of Biology participates in the Interdepartmental Graduate Program in Toxicology. This program offers research opportunities leading to advanced degrees within several specialties of toxicology. The College also participates in an interdisciplinary, interdepartmental program in ecology which operates under the Ecology Center. The Ecology Center brings distinguished scientists to campus, fosters faculty research, and enhances graduate education in all areas of ecology.

Objectives

USU has always given a high place to the sciences. Modern civilization is based on science, most facets of which are fundamental in a land-grant university.

Opportunities for rewarding careers are excellent in the fields of science. These opportunities exist in education, research, conservation, service, and industry.

The curricula of the science departments are designed to achieve five purposes:

First, they serve all students. No college graduate can be considered educated without an appreciation of scientific principles.

Second, the college trains teachers of science at all levels of education. Highly competent teachers are absolutely essential to the continued well-being and development of society.

Third, students are prepared to take positions in industry and business in a highly technological world.

Fourth, education is provided in the health fields both at the preprofessional and entry level. The college has excellent programs in predental and premedical education with an exceptional record of placing students in dental and medical schools. Undergraduate degrees in the various departments of the college can be tailored to include predental and premedical training. Other programs prepare graduates to enter the health profession directly upon graduation.

Fifth, the College of Science educates research scholars in many fields of science. This is accomplished by completing a sound undergraduate degree in the field, followed by years of graduate specialization.

Students planning to enter the sciences are urged to discuss their plans and goals early with advisers, who are available in each academic department. Basic coursework in mathematics, chemistry, physics, and computer science is essential to most areas of science.

Admission Requirements

Students accepted in good standing by the University are eligible for admission to all departments in the College of Science. Students majoring in Computer Science must qualify for advanced standing status on the basis of their academic performance. Specific details are given in the Computer Science section of this catalog.

General College of Science Requirements

Orientation Requirement. All students graduating from the College of Science are required to take the college orientation course: Sci 150, Science Orientation.

Written Communications Requirement. In addition to the University's written communication requirement, the college requires a junior level writing class. This requirement may be filled by completing either English 301 or 305.

Bachelor of Science Core Requirements. Students working toward the Bachelor of Science degree in any major within the College of Science must complete the following:

A. Math 220 and 221.
B. Either CS 160 or Stat 201.
C. One of the following sequences: (1) Biol 125 and either Biol 126 or Biol 127; (2) Chem 121, 122, and 124; (3) Geol 111 and 200; (4) Phyx 221 and 222.

Majors in Biology, Chemistry and Biochemistry, Geology, and Physics **cannot** satisfy requirement *C* by taking a sequence in their own discipline. Higher level courses than the ones listed in the three categories above may be substituted in some instances. Approval for any substitutions must be obtained in advance.

Note: The above Bachelor of Science requirements are **not** in effect for the Bachelor of Arts degree.

Science Major

A beginning freshman student who wishes to major in science, but who has not selected a specific major, may register in the

[1]Jointly administered with the College of Humanities, Arts and Social Sciences.

college as a Science Major. A course of study will be developed that will attempt to maximize transfer into the various departmental majors in the college. Students in the Science Major will be required to transfer to a departmental major after one year of study.

Scholarships

Each year, the college offers a four-year scholarship to an outstanding freshman entering the University. The scholarship consists of up to 12 quarters of tuition waivers plus $2,000 given over four years ($500 per year). The scholarship is awarded on the basis of performance on a College of Science exam, ACT scores, and grades received in high school. The College of Science Scholarship exam is given at the time of the University Scholar Competition. Other scholarships are available through some of the departments in the college. See the Awards, Honors, Scholarships, and Grants-in-aid section of this catalog.

Graduate Assistantships and Fellowships

Excellent graduate assistantships and fellowships are available in all departments. Assistantships are available both for teaching and research. Applications should be made directly to the department concerned.

Graduate Study

Graduate study programs leading to the MS degree are available in each department in the college. In addition, the Department of Mathematics and Statistics offers a MMath (Master of Mathematics) degree. The departments of Biology, Chemistry and Biochemistry, Mathematics and Statistics, and Physics offer programs leading to the PhD degree. See the *Graduate Catalog* for more information on these programs.

Liberal Arts and Sciences Program

The College of Science, in cooperation with the College of Humanities, Arts and Social Sciences, sponsors a Liberal Arts and Sciences Program (LASP). LASP promotes integrated learning across the life sciences, humanities, physical sciences, arts, and social sciences. All USU students are welcome in LASP. With college and departmental consent, the LASP Area Studies Certificate may be used in place of the Broadening Knowledge portion of General Education. The certificate, along with the LASP minor and major, are described on pages 37-38.

Science/HASS Advising Center

The Science/HASS Advising Center is a campus office designed to provide academic advising for students in the College of Science and the College of Humanities, Arts and Social Sciences. Academic advisers counsel these students in the Area Studies Certificate in the Liberal Arts and Sciences Program (LASP).

Honors Program

Several departments in the college participate in the University Honors Program by offering special honors courses and by sponsoring an option for graduation with departmental honors.

Undergraduate Research

The sciences provide an ideal setting for research. Many departments within the College of Science provide opportunities for undergraduate students to participate in research activities. Interested students should discuss this option with their academic adviser.

Science Courses

150. Science Orientation. Orientation to different disciplines in the College of Science and their relationship to each other. Introduction to the scientific method. (1F,Sp)

430. Science in Society. An investigation of the interactions between current scientific topics and societal goals and concerns. Intended as a capstone for the LASP Science and Society cluster and science teaching majors. Prerequisite: senior standing and consent of instructor. (3F,W,Sp,Su)

School of
Accountancy

College of Business

Head: Ernst & Young Professor Clifford R. Skousen
Office in Business 511, 797-2330

Director, Master of Accounting Program: Associate Head and Professor James W. Brackner
Director of Research: Arthur Andersen Alumni Professor Richard L. Ratliff

Professor Frank A. Condie; **Richard C. and Vera C. Stratford Professor** David H. Luthy; **Arthur Andersen Executive Professor** Jay H. Price, Jr.; **Professors Emeritus** Norman S. Cannon, Larzette G. Hale; **Associate Professors** Richard L. Jenson, I. Richard Johnson; **Assistant Professors** E. Vance Grange, Irvin T. Nelson; **Adjunct Assistant Professors** M. Kay Jeppesen, Dale G. Siler; **Instructors** Ralph L. Peck, Jack W. Peterson, Franklin D. Shuman; **Adjunct Lecturers** Rosemary R. Fullerton, Joanne R. Jensen

Degrees offered: Bachelor of Science (BS), and Bachelor of Arts (BA) in Accounting; Master of Accounting (MAcc)

Mission

The mission of the School of Accountancy at Utah State University is excellence in accounting education through teaching, research, and service. The school endeavors to provide high quality accounting preparation for professional careers to on-campus and extension students, to intellectually contribute to the field of accounting through the dissemination of research, and to render service. The school is dedicated to fostering economic and social progress, and to developing students into responsible and ethical citizens committed to active roles in their profession and service to society.

Objective

The objective of the School of Accountancy is to provide high quality accounting preparation for professional careers in industry, public accounting, non-for-profit organizations, governmental organizations, and accounting and business entrepreneurship. The baccalaureate program is devoted to providing basic conceptual accounting and business knowledge, along with general education, as a well-rounded foundation for career development. The Master of Accounting program provides greater breadth and depth in accounting, taxation, and business to develop a high level of understanding, skill, and leadership capability for entrance into professional accountancy and related business careers. The master's program qualifies graduates to sit for the Certified Public Accountant's examination.

The accounting curriculum is designed to help students prepare to meet changes in social, economic, and technological development. Academic course requirements for the bachelor's degree include general education coursework, as well as supporting courses in mathematics, economics, computer science, business communications, business administration, and accountancy. The program provides an opportunity to choose from a number of elective courses to broaden educational backgrounds and enhance employment opportunities.

Career Opportunities

Practice in the profession of accounting has become more complex, with computerized information and accounting systems becoming an integral part of the various accounting functions. University training is essential to prepare for high-level accounting careers in business, government, and public accounting.

Graduates of the accounting program find employment in a variety of industrial companies, nonbusiness and government agencies, and both large and small public accounting firms. Graduates hold all levels of executive positions within organizations, including supervisors, managers, partners, staff accountants, and controllers. Nonbusiness units and government agencies, such as the Internal Revenue Service, provide jobs in many varied accounting functions.

Admission and Graduation Requirements

New freshmen admitted to USU in good standing qualify for admission to the College of Business. Students with 1-69 quarter hours of credit, who are transferring from other institutions or from other colleges at USU, need a minimum overall GPA of 2.20. Students transferring with 70 or more quarter hours of credit are required to have a minimum overall GPA of 2.50. Transfer students and others desiring to be admitted to the School of Accountancy must have a minimum GPA of 2.5 and must meet the prespecialization requirements for advanced standing.

Students who have qualified for Advanced Standing will then complete additional business and accounting courses. Through their business courses, students increase their understanding of how to deal with business problems relating to finance, marketing, production, and management, and address the role of business in the community. Their accounting courses provide technical expertise in accounting related subjects.

The requirements for an accounting major, including the University general education requirements required for accounting majors and the prespecialization requirements for advanced standing, are summarized below:

General Education Requirements

Accounting majors are required to complete 42 credits of general education, plus 6 credits in written communication. (See USU Written Communication and General Education Requirements, pages 22-28, for minimum requirements and limitations.) Specific requirements include the following:

1. Written Communication (6 credits minimum). Engl 101 (3 credits) and Engl 200 or 201 (3 credits). AP English or CLEP credit may be used to satisfy Engl 101.

2. Other Learning Skills (12 credits, 10 credits minimum). Math 105 or higher (5 credits), CS 150 or 170 (4 credits) and BIS 140 (3 credits). CS 170 is a prerequisite for several other Computer Science courses. BIS 140 can be tested out if the student has previous education and/or experiences.

3. Broadening Knowledge (30 credits). Physical Sciences (PS), 6-13 credits; Life Sciences (LS), 6-13 credits; Social Sciences (SS), 5 credits; Humanities and Arts (HU), 6 credits; Integrative Option Courses (IO), 0-7 credits, including LAS 125 (LAS 125 is not required if accounting major is declared after 60 credits earned). As an alternative to the Broadening Knowledge requirement, accounting majors are encouraged to complete an Area Studies Certificate in Liberal Arts and Sciences. For information and requirements for the certificate, see pages 26-27 in this catalog. Credits necessary to earn the certificate range from 46 to 57 credits, depending on the options or clusters selected. The Science and Society cluster and the Civilization cluster are the two clusters recommended for accounting majors.

Courses Outside College of Business

The College of Business requires that at least 93 credits be taken in courses outside the College of Business. For this requirement, up to 14 quarter credits in Economics and 9 quarter credits in Statistics may be counted among those taken outside the College of Business. Generally, 18 additional elective credits outside the College of Business will be necessary if the Broadening Knowledge option is completed. If the Certificate in Liberal Arts and Sciences is completed, fewer elective credits will be necessary to meet the 93-credit requirement.

College of Business Enrollment Restrictions

1. An overall GPA (transfer credits included) of 2.20 and 30 credits of completed college-level work are required for admission into Acct 201, 203; MHR 299; and BIS 255.

2. An overall GPA of 2.50 and completion of 45 credits are required for admission into Acct 311 and 331.

3. An overall GPA of 2.50 and completion of 60 credits are required for admission into Acct 312, 313, 341; BA 308, 340, 350, 370; BIS 310, 314, 330, 355, 371; Econ 340; and MHR 311, 360.

4. All 400- and 500-level courses in the College of Business, with the exception of Economics courses and MHR 489, are restricted to students with unconditional advanced standing. A 2.50 overall GPA and completion of 90 credits are required for admission into these courses.

5. An overall GPA of 2.50 and completion of 125 credits are required for admission into MHR 489.

Advanced Standing Requirements

Students are required to achieve unconditional Advanced Standing to be admitted to the School of Accountancy. Until unconditional Advanced Standing has been attained, students are not allowed to take 400- or 500-level courses in the College of Business, except for Economics courses.

The requirements for attaining unconditional Advanced Standing in the School of Accountancy are as follows:

1. Students must have completed a minimum of 85 credits and must have earned an overall grade point average (GPA) of at least 2.50 for all credit hours taken up to the time of petition for Advanced Standing. Accounting courses must also average 2.50. This includes all transfer credits.

2. Students must have completed the prespecialization requirements for both the College of Business and the School of Accountancy as indicated below, and must have earned a GPA of 2.50 or above in these courses.

Advanced Standing Application Forms can be obtained at the Student Service Center, College of Business, Business 306.

The **College of Business prespecialization requirements** are as follows: Acct 100, 201, 331 (Acct 100 is not required if a College of Business major is declared after 90 credits are earned, or by consent of college adviser); MHR 299; BIS 140, 255 (BIS 140 can be tested out by students with previous education and/or experience); CS 150 or 170; Econ 200, 201; Math 105; and Stat 230. Students should note that CS 150, 170; Econ 200, 201; and Math 105 may also be used to fulfill general education requirements.

The **School of Accountancy prespecialization requirements** are as follows: Acct 311, Math 215; Spch 105, 260, or 305; Psy 101 or Soc 101; BIS 245, or BIS 246 and 247 (BIS 247 is not a prespecialization requirement); and LAS 125. If an accounting major is declared after 60 credits earned, LAS 125 is not required.

Additional College of Business and School of Accountancy Requirements

In addition to the College of Business Prespecialization Requirements and the School of Accountancy Prespecialization Requirements outlined above, the Business Core requirements and the Accounting Major Requirements listed below must be completed to earn a baccalaureate degree in accounting. Fifty percent of the business credits required for a business degree must be taken at the Utah State University campus or at a designated residence center.

To be recommended by the School of Accountancy for graduation, accounting majors must have a grade point average of at least 2.50 in their accounting courses, as well as an overall GPA of 2.50. Accounting courses may only be repeated once. A graduation application should be filed with the School of Accountancy two quarters before anticipated graduation.

Business Core Requirements (36-37 credits). These courses are offered every quarter, so scheduling is simplified. Completion of the prespecialization requirements fulfills all prerequisite courses for the Business Core Requirements, with the exception of BA 350, which must be taken before MHR 412. MHR 489 is a capstone course and should be taken near the end of the senior year. Following is a list of the courses required for the Business Core: Econ 340; one of Econ 400, 401, 500, and 501; BIS 247 (not required if BIS 245 was taken); BA 308, 340, 350, 370; MHR 311, 412, and 489.

Accounting Major Requirements (44 credits). Since some accounting courses are not offered every quarter and many have prerequisites, students should plan their program at least a year ahead. Following is a list of required courses: Acct 201, 311, 312, 313, 331, 332, 341, 450, 451, 521, and 541. Acct 505 is suggested for careers in industry, along with MAE 211, Manufacturing Operations—Fundamentals. Accounting students must also complete enough general education and elective courses to meet

the 93-credit minimum outside the College of Business and the 186-credit minimum required for graduation.

Accounting Minor

Students with a major in an area other than Accounting may qualify for an Accounting minor. A minimum of 24 credits is required. Students seeking a minor must be approved by the School of Accountancy and must maintain a 2.50 grade point average for Accounting courses taken. The following courses are approved for an Accounting minor: Acct 201, 203 or 331, 311, 312, and two additional 300-, 400-, or 500-level accounting courses. Students working toward a second bachelor's degree may substitute Acct 601 and 602 for Acct 201 and 203, making a total of 22 credits required for the minor. Acct 331 may qualify as one of the two additional 300-, 400-, or 500-level accounting courses, if Acct 203 has been taken.

Second Bachelor's Degrees

Students pursuing a second bachelor's degree in accounting must meet the same minimum grade point average requirements (2.50 in accounting courses and 2.50 overall) for graduation.

Graduate Program

The Master of Accounting (MAcc) program provides additional specialization in accounting or taxation, and allows the student to take several elective courses outside the School of Accountancy. The Master of Accounting degree qualifies graduates to sit for the Certified Public Accountant's examination in any state. Students with an undergraduate degree in accounting which meets the USU undergraduate accounting program requirements will be expected to complete 45 credits of graduate work in order to qualify for the MAcc. Students with less than the equivalent of the undergraduate program will be expected to make up any deficiencies in addition to completion of 45 credits in the graduate program. Students may apply for admission to the graduate program during their senior undergraduate year.

Beta Alpha Psi

Delta Omega Chapter of Beta Alpha Psi, the national honorary and professional accounting fraternity, provides many professional accounting experiences for accounting students throughout their academic program.

Institute of Management Accountants

A student chapter of IMA provides professional experiences in the area of management accounting. This organization is especially for students interested in careers in industry, not-for-profit organizations, governmental organizations, and accounting and business entrepreneurship.

Accounting Courses

100. Business Orientation. Orients freshmen and transfer students to College of Business programs, academic and student services, professional organizations, and career possibilities. (1F,W,Sp)

105. Survey of Accounting. An overview of accounting concepts with special emphasis on practical applications. (4)

201. Introduction to Financial Accounting. Introduction to the basic accounting cycle and financial statement preparation. Application of basic accounting principles in determining financial position and income. Prerequisites: Completion of 30 credits and 2.2 GPA. (4F,W,Sp,Su) ©

203. Introduction to Managerial Accounting. Managerial uses of accounting information including planning (budgeting), controlling, and decision making. Also includes selected financial accounting issues, statements of cash flow, and analysis and interpretation of financial statements. Prerequisite: Acct 201. (4F,W,Sp,Su) ©

225. Introductory Internship. An introductory level experience in a career-related internship position approved by the cooperative internship office. One credit for every 75 hours of internship experience. Maximum 6 credits. (1-6F,W,Sp,Su) ®

311. Intermediate Accounting I. First course in intermediate accounting with emphasis on financial statement preparation and formats, authoritative bodies and pronouncements, and accounting research problems and techniques. Prerequisites: Acct 201, BIS 245 or 246 or proficiency in spreadsheet software. (4F,W,Sp,Su)

312. Intermediate Accounting II. Second course in intermediate accounting with emphasis on accounting for elements of financial statements and recent statements of the FASB and other authoritative bodies. Prerequisite: Acct 311. (4F,W,Sp,Su)

313. Intermediate Accounting III. Third course in intermediate accounting with emphasis on practice and theory relating to pensions, income taxes, changing prices, and other complex problems and issues in financial accounting. Prerequisite: Acct 312. (4F,W,Sp)

325. Discussions with Business Leaders. Examines new methods for improving U.S. competitiveness by attending the Partners Program seminar sessions and hosting visiting executives from top U.S. companies. Repeatable to a maximum of 6 credits. (1F,W,Sp,Su) ®

331. Management and Cost Accounting I. First course in accounting information used by business managers. Emphasis on how to accumulate and analyze product and service costs for business decision making. Prerequisites: Acct 201; and BIS 245, or BIS 246 and 247; or proficiency in spreadsheet software. (4F,W,Sp,Su) ©

332. Management and Cost Accounting II. Second course in accounting information used by managers. Emphasis on information and systems useful in planning and controlling business operations and decision models. Prerequisite: Acct 331. (4F,W,Sp)

341. Income Taxation I. Emphasis on Federal income taxation of individuals. Introduction to taxation of corporations and tax research methods. Prerequisite: Acct 311 or permission of instructor. (4F,Sp,Su)

410 (d610).[1] Government Contract Administration. Provides basic information and description of the general environment and content of government contracts (primarily U.S. Government Contracts). Emphasis is on the administration of and accounting for these contracts. (4Sp)

450. Accounting Information Systems I. Theoretical concepts underlying accounting information systems analysis and design, system controls, and auditing EDP systems. Prerequisites: Acct 311; CS 150 or 170; BIS 245, or BIS 246 and 247, or proficiency in database applications. (4F,W,Su)

451. Auditing I. The auditor's attest function, to include standards, procedures, legal environment, professional conduct and ethics, and internal control. Aspects of internal and governmental auditing are introduced. Prerequisite: Acct 450. (4F,W,Sp)

479. Internship in Accounting. Accounting work experience with public accounting firms and approved business concerns. Prerequisite: Acct 451 or 541. (1-7F,W,Sp,Su)

485H. Senior Honors Seminar. Presentation of senior thesis project created in the 495H course. Focus is on scholarly approach, problem definition, and methodology. (1Sp)

490. Independent Research and Readings. Selected reading and research individually assigned, handled, and directed. Problems of mutual interest to students and the instructor are investigated and reported. (1-4F,W,Sp,Su)

495H. Senior Honors Thesis. Creative project that will then be written up as a Senior Thesis as required for an Honors Plan. (3-9F,W)

505. Management Accounting Issues and Problems. Issues and problems in management accounting relating to accounting, finance, and management. Prerequisite: senior-level accounting major or consent of instructor. (4Sp)

521. Advanced Accounting I. Includes accounting for government and other nonbusiness organizations, an introduction to consolidated financial statements, and accounting for multinational organizations. Prerequisite: Acct 312. (4F,W,Sp)

541. Income Taxation II. Federal income taxation of partnerships, corporations, S-corporations, estates and trusts, and gifts. Prerequisite: Acct 341. (4F,W,Su)

565 (d665). Accounting Topics and Issues. Selected contemporary accounting topics and issues, including the study of accounting for specialized industries. (1-4) ®

Graduate[2]

601, 602. Accounting for Management Control. (3) (3)

605. Professional Accounting Cases and Problems. Prerequisites: Acct 313, 521, and 541. (4Sp,Su)

610 (d410). Government Contract Administration. (4Sp)

621. Advanced Accounting II. Prerequisite: Acct 521. (4W,Su)

635. Advanced Managerial Accounting. Prerequisite: Acct 203 or 331 or 602. (4F,Sp,Su)

641. Tax Research and Procedures. Prerequisites: Acct 341 and 541. (4F)

642. Taxation of Corporations and Shareholders. Prerequisites: Acct 341 and 541. (4W,Su)

643. Tax and Financial Planning. Prerequisites: Acct 341 and 541. (4W)

644. Taxation of Partnerships, Estates, and Trusts. Prerequisites: Acct 341 and 541. (4F)

645. Taxation of Property, Oil, and Gas. Prerequisites: Acct 341 and 541. (4)

646. Tax Topics. Prerequisites: Acct 341 and 541. (4Sp)

650. Accounting Information Systems II. Prerequisite: Acct 450. (4F,Su)

651. Auditing II. Prerequisite: Acct 451. (4Sp)

661. Accounting Theory and Research. Prerequisite: Acct 313. (4W,Su)

665 (d565). Accounting Topics and Issues. (1-4) ®

679. Internship in Accounting. (1-7F,W,Sp,Su)

690. Independent Reading and Research. (1-6F,W,Sp,Su) ®

696. Professional Paper. (1-4F,W,Sp,Su)

699. Continuing Graduate Advisement. (1-3) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

Department of
Aerospace Studies
College of Humanities, Arts and Social Sciences

Head: Professor and Lt. Colonel Ken Peterson
Office in Military Science 107, 797-8723

Assistant Professors Captain Douglas J. Bristow, Second Lieutenant Jay Kearl, Major Victoria L. Rondeau

Objectives

Air Force ROTC provides educational experiences that develop skills and attitudes vital to the career of an Air Force officer. The purpose of the course is to give an understanding of the mission and the global responsibilities of the United States Air Force. The academic phase develops background in national and international affairs to help understand and evaluate world events. In addition, the curriculum includes experiences designed to stimulate and develop an interest in the Air Force (e.g., orientation flights and visits to Air Force bases); opportunities to apply the principles of leadership, human relations, management, and staff work in practical situations; and other related experiences.

Requirements

Physical Fitness and Medical. All students must meet the physical fitness and medical standards for general military service.

Age Limitations. To qualify as a pilot or navigator, students must be able to finish the aerospace studies program and graduate from the University before age 26 1/2 years. Other students must complete the military program and graduate from the University prior to reaching the age of 30.

Academic Requirements. Successful completion of the following courses is required for commissioning: AS 301, 302, 303, 311, 312, 313, 401, 402, 403, 411, 412, and 413. In addition, when entering the final two years, a student must agree to accept an Air Force commission for four years, if it is offered, and to serve on active duty, if directed to do so. Upon initial enrollment at the University, students should schedule Aerospace Studies classes to be completed simultaneously with requirements for a bachelor's degree.

Although the AFROTC program is designed primarily for the student to complete in four years, all requirements for commissioning may be completed in only two years. Students interested in the two-year program should apply prior to the January which precedes their final two years of college. Screening of candidates for the two-year program will conform to the same requirements as for selecting advanced students in the four-year program. Prior to formal enrollment in the two-year program, each student must successfully complete six weeks of field training. The course of instruction is the same as that required for the four-year program, which includes a four-week summer field training session, with the classwork being covered in two additional weeks of field training.

Minor. A minor in Aerospace Studies will be awarded upon completion of commissioning requirements.

Veterans. A veteran may apply for the AFROTC program if he or she can complete the program prior to reaching age 30. The general military course (first two years) may be waived for prior military service. However, veterans must successfully attend field training prior to taking AS 301, 302, 303, 311, 312, 313, 401, 402, 403, 411, 412, and 413. Veterans normally will be entered in the two-year program.

Scholarships and Financial Aid

Financial Aid. AFROTC cadets will normally receive a $150 per month allowance during their last two years of AFROTC. Also, cadets are paid approximately $570 per month and are provided free room, board, and transportation during the summer field training sessions.

Scholarships. AFROTC college scholarships are available on a competitive basis. These scholarships pay tuition, fees, textbook allowances, and $150 per month nontaxable allowance. USU offers a partial room and board scholarship for scholarship recipients. Eligible freshmen and sophomores should apply directly to the head of the Aerospace Studies Department. High school seniors should normally apply for four-year scholarships early in the fall of their senior year. Scholarship recipients must complete English composition and mathematical reasoning course requirements as established by AFROTC.

Uniforms and Texts. All Air Force texts and uniforms are furnished at no expense to the student.

Miscellaneous Information

All Cadets. To meet the challenges, keep up with technological advancements, and explore the opportunities of the ever-broadening horizons in the aerospace age, officers possessing a variety of skills are required by the Air Force. These skills cover the exact sciences and social sciences, but are not limited to these study areas. After being called to active duty, individuals will serve four years. Interested students should contact the AFROTC Department for information on the Air Force specialist fields related to their academic major.

Delay of Entry on Active Duty. If cadets complete the AFROTC program and receive commissions, they may request a delay in call to active duty if they desire to continue studies toward a graduate degree. The length of the delay depends upon current AFROTC regulations. Students entering flight training must do so before reaching 26 1/2 years of age.

Summer Training. (a) Field Training (six weeks) is a prerequisite for cadets entering the AFROTC two-year program. Training will be given at an Air Force base and will last for six weeks. Up to ten university credits may be granted for this training.

(b) Field Training (four weeks). All cadets in the four-year program will attend a four-week summer training camp. Attendance at this camp is between the sophomore and junior year at a selected Air Force base. Up to six credits may be granted for this training.

Leadership Laboratory. A Leadership Laboratory period is required each week during the fall, winter, and spring quarters for each year of aerospace studies. Interested students should check the current *Schedule of Classes* for the Leadership Laboratory schedule.

Aerospace Studies Courses

101. The U.S. Air Force Today. Doctrine, mission, organization of the U.S. Air Force. (1F)

102. The U.S. Air Force Today. Functions of strategic offensive forces, strategic defensive forces, and general purpose forces. (1W)

103. The U.S. Air Force Today. Functions of U.S. aerospace support forces. (1Sp)

111, 112, 113. Leadership Laboratory I. Laboratory courses for The U.S. Air Force Today sequence. AS 111 must be taken concurrently with AS 101; AS 112 must be taken concurrently with AS 102; and AS 113 must be taken concurrently with AS 103. (1F) (1W) (1Sp)

201. Development of Air Power. Historical study of the development of air power from the first flight experiments of the eighteenth century through World War II. (1F)

202. Development of Air Power. Historical study of the development of air power after World War II through the Korean War and air power effects on cold war strategy during the Berlin Airlift. (1W)

203. Development of Air Power. Study of air power during the Cuban missile crisis of 1962, the war in Southeast Asia, and its use in nonmilitary operations. (1Sp)

211, 212, 213. Leadership Laboratory II. Laboratory courses for Development of Air Power sequence. AS 211 must be taken concurrently with AS 201; AS 212 must be taken concurrently with AS 202; and AS 213 must be taken concurrently with AS 203. (1F) (1W) (1Sp) ®

301. Management and Leadership Theory. Includes the study and application of concepts of human behavior and human relations or organizational situations. Discusses the need and means for maintaining individual and organizational discipline. (3-4F)[1]

302. Management and Leadership Theory. Includes the study of theoretical and practical management as applied in the Air Force. Introduces information systems, quantitative approaches to decision-making, and resource control techniques. Includes problem solving exercises, field trips, oral and written reports. (3-4W)[1]

303. Management and Leadership Theory. A study of the execution phase of management in the Air Force. Primary emphasis on management methods used in the Air Force for management and control of personnel, material, and monetary resources. (3-4Sp)[1]

311, 312, 313. Leadership Laboratory III. Laboratory courses for Management and Leadership Theory sequence. AS 311 must be taken concurrently with AS 301; AS 312 must be taken concurrently with AS 302; and AS 313 must be taken concurrently with AS 303. (1F) (1W) (1Sp)

340. Field Training (four weeks). Students in the four-year program participate in four weeks of Field Training. The major areas of study include junior officer training, aircraft and aircrew orientation, career orientation, survival training, base functions and Air Force environment, and physical training. Repeatable up to maximum credit. (1-6F,W,Sp) ®

360. Field Training (six weeks). Two-year program. The major areas of study included in the six-week Field Training program are essentially the same as those conducted at four-week Field Training and in the General Military Course including Leadership Laboratory. Repeatable up to maximum credit. (1-10F,W,Sp) ®

401. National Security Forces in Contemporary American Society. An examination of the needs for national security. Provides an in-depth look at the national security process. Studies the Constitution and how separation of powers affects national security policy. An analysis of the evolution and formulation of American defense policy and strategy. Added emphasis on written and verbal communication skills. (3-4F)[1]

402. National Security Forces in Contemporary American Society. A look at aerospace doctrine. An examination of the methods for managing conflict. A study of alliances, regional security, arms control, and terrorism. Increased emphasis on written and verbal communication skills. (3-4W)[1]

403. National Security Forces in Contemporary American Society. Special topics focus on the military as a profession, officership, the military justice system, and current issues affecting military professionalism. Communication skills and techniques continued. Emphasis on preparation to enter active duty as an officer. (3-4Sp)[1]

411, 412, 413. Leadership Laboratory IV. Laboratory courses for National Security Forces in Contemporary American Society sequence. AS 411 must be taken concurrently with AS 401; AS 412 must be taken concurrently with AS 402; and AS 413 must be taken concurrently with AS 403. (1F) (1W) (1Sp)

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[1]This course is available for credit under the Honors Program. To receive four credits, the requirements set by the department for honors credit must be met.

Department of

Agricultural Systems Technology and Education

College of Agriculture

Head: Associate Professor Gary S. Straquadine
Office in Agricultural Systems Technology and Education 101C, 797-2230

Professors Robert L. Gilliland, Weldon S. Sleight; **Professor Emeritus** Gilbert A. Long; **Associate Professor** Stephen E. Poe; **Associate Professor Emeritus** Keith W. Hatch; **Assistant Professors** Kathryn L. "Kitt" Farrell-Poe, Richard M. Joerger, Bruce E. Miller; **Lecturers** Darwin S. Jolley, Evan P. Parker

Degrees offered: Bachelor of Science (BS) and Bachelor of Arts (BA) in Agricultural Education; BS, BA, Master of Science (MS), and Master of Arts (MA) in Agricultural Systems Technology

Areas of Specialization: *BS level*: Business and Mechanization; *MS level*: Agricultural Extension Education, Agricultural Mechanization, International Agricultural Extension, and Secondary/Postsecondary Agricultural Education

One-year Certificate and Associate of Applied Science (AAS): Agricultural Machinery Technology

Objectives

The programs offered in Agricultural Systems Technology and Education are for students who are preparing for positions as agricultural science and technology teachers and positions in agricultural extension, agricultural mechanization, agribusiness, and agricultural production and management.

The facilities for these programs include laboratories with specially designed equipment for practical instruction in agricultural systems and mechanization, which includes computer application, agribusiness, agricultural buildings, engines, electricity, hydraulics, machinery, and repair welding. The farms and research laboratories available in the College of Agriculture support high technology instruction in plant science, animal science, soils, and agribusiness.

Requirements

Departmental Admission Requirements. Admission requirements for the Department of Agricultural Systems Technology and Education are the same as those described for the University on pages 8-11. Students in good standing may apply for admission to the Agricultural Systems Technology and Education Department.

Bachelor of Science in Agricultural Education. Preparation in Agricultural Education includes technical agriculture, economics, and business. Students selecting the teaching option will also enroll in principles and techniques of teaching courses.

Students interested in teaching agricultural production, agricultural business, agricultural mechanics, horticulture, or other phases of agriculture will be guided into areas of their major interest. Agricultural backgrounds or summer agricultural experiences are necessary for teacher certification.

An application for admission to teacher education should ordinarily be completed before the junior year (see College of Education requirements). Approval for admission to teacher education is a prerequisite to certification candidacy and to enrollment in education and psychology courses.

Requirements for the **Bachelor of Science in Agricultural Education** are listed briefly below. For more detailed information on courses and the recommended sequence for taking them, see the major requirement sheet available from the Agricultural Systems Technology and Education department.

ASTE 101, 201, 271, 301, 303, 304, 309, 325, 345, 360, 450, 460, 511; ADVS 111, 245; RLR 300; BIS 140; Chem 111; InsT 445, 447; Math 101; PlSc 310, 430, 555; Psy 101, 366; ScEd 301, 302, 404, 510; and Soil 358, 359, 400.

Students must also fulfill University General Education requirements, and select other courses from Agricultural Economics, Business Administration, Animal or Dairy Science, Plant Science, Agricultural Mechanics, and Natural Resources.

Bachelor of Science in Agricultural Systems Technology. This major has two options: *Business* and *Mechanization*. Preparation in either option includes technical agriculture, economics, and business. The Mechanization option requires additional courses in technical electives and communication skills development.

The Bachelor of Science in Agricultural Systems Technology, **Business Option,** includes the following courses: ASTE 101, 201, 283, 309, 310, 375, 432, 520, and 17 credits of departmental electives. Students will complete a minor in Business or Agribusiness. Additional requirements in Animal Science, Plant and Soil Sciences, and Rangeland Resources must also be met. In addition, students must complete designated electives and the University General Education requirements.

Bachelor of Science in Agricultural Systems Technology, **Mechanization Option,** includes the following courses: ASTE 101, 201, 283, 300, 301, 309, 375, 400, 432, 520; Chem 111, 141, 144; Econ 200, 201; Math 105; Stat 201 or 230 or 301 and Soil 400. Students must also fulfill University General Education and designated electives.

The **Associate of Applied Science Degree in Agricultural Mechanization** will include a minimum of 10 credits in General Education classes, 43 credits in Agricultural Mechanization, 19 credits in business and related classes, and 20 credits of elective coursework. For more detailed information on courses see the

requirement sheet available from the Agricultural Systems Technology and Education Department.

Agricultural Machinery Technology Certificate/Diploma. The one-year agricultural program will meet the needs of persons interested in employment opportunities with agricultural dealerships and companies in the areas of parts and service, as well as with farm suppliers, feed and fertilizer agencies, corporate farms and ranches, and other related industries. The vocationally oriented agricultural technology program includes a cooperative occupational experience placement at the end of the first year of instruction.

Requirements for the one-year program include: ASTE 112, 113, 114, 161, 162, 163, 164, 225, 303, 310. See major requirement sheet, available from the department, for more detailed information.

Minor in Agricultural Systems Technology. A minimum of 18 credits approved by a faculty adviser are required.

Graduate Study

The department offers the Master of Science degree. See *Graduate Catalog* for more information.

Agricultural Systems Technology and Education Courses

101. Introduction to Agricultural Systems Technology. Introduction to problem solving related to agricultural power and machinery, soil and water conservation, structures and animal environment, and electrical circuits. (4F)

112. Forage and Harvesting Equipment. Theoretical principles and applied technology of forage and harvesting equipment. (3F)

113. Agricultural Planting and Tillage Equipment. The fundamentals and principles in the operation, maintenance, and repair of agricultural, planting, and tillage equipment. (3Sp)

114. Agricultural Power Units. Principles involved in overhauling and reconditioning agricultural power units including engines and subassemblies. (6F)

118. Swine Waste Treatment Systems. Analysis of different types of manure collection, handling, and storage systems. Investigation of waste disposal systems, equipment, and appropriate application rates. (3W)

161. Agricultural Electrical Components. The various types of electrical components are studied as they are applied on agricultural equipment and power units. (3F)

162. Agricultural Machinery Hydraulics. Principles and components utilized in agricultural machinery hydraulic technology as related to the hydraulic system. (3W)

163. Agricultural Machinery Power Trains. The fundamental principles in the transmittal of power from the tractor power unit to the implement. (6W)

164. Agricultural Equipment and Parts Retail Systems. Introduction to principles and operation of computer software systems related to requisitioning, inventory control, and management within the agricultural machinery and small business industries. (3F)

200. Maintenance of Dairy Equipment. Principles involved in maintenance of dairy equipment and facilities including electricity, plumbing, refrigeration, air and vacuum, and feeding equipment. (3W)

201. Dynamic Interactions in Agricultural Systems. Introduction to systems approach to solving problems. Theory of group dynamics and conflict resolution in context with current agricultural and public policy issues explored. (3F)

202. Swine Equipment and Building Systems. Layout and organization of swine production facilities and the maintenance of component parts. Course will develop systems of production and provide a perspective of available methods and equipment to reduce labor and increase productivity. (3Sp)

225. Occupational Experience in Agriculture. Supervised occupational experiences for technical vocational preparation. (1-5F,W,Sp,Su) ®

235. Landscape Irrigation Systems. Principles of design and installation of irrigation systems for the home landscape. (2Sp)

271. Orientation to Agricultural Education. A planned supervised field experience program for the purpose of gaining youth advising skills and gaining early entry into schools or preparation for extension youth assignment. (2F)

283. Agribusiness: Marketing and Sales. A beginning study of agribusiness, to include inputs, production, processing, distribution, marketing, and sales. (3F)

293. Individualized Projects in Agricultural Mechanics. Basic skill preparation for employment in agricultural industry. (1-5F,W,Sp,Su) ®

300. Operation and Field Adjustments of Agricultural Tractors and Implements. Principles and techniques in the operation and preventive maintenance of agricultural tractors and implements. (1-2F,Sp)

301. Agricultural Structures and Construction. Planning, estimating, layout, construction materials, painting, wiring, plumbing, concrete, and masonry. Three lectures, two labs. (5Sp)

303. Agricultural Maintenance Welding. General overview of various welding processes. Provides manipulative experience and instruction for beginners and veterans with up-to-date technical information in the welding industry. (3Sp)

304. Field-based Experience for Agriculture Preservice Teachers in Secondary Schools. Field-based experiences in vocational agricultural secondary programs prior to student teaching. (1F,W,Sp)

305. Technical Writing in Agriculture. Theory, analysis, and guided practice of designing, writing, and editing agricultural business correspondence and technical reports based on the subject, purpose of the writing, and audience needs. Prerequisites: upper division standing and completion of Engl 200, 201, or equivalent. (3F,W,Sp,Su)

309. Computer Systems and Their Application in Agriculture. Use of programmable calculators, microcomputers, and other computer systems in solving problems common to agriculture. Prerequisite: BIS 140. (3F,W,Sp)

310. Program Leadership. Study of leadership styles; practice in selection and use of role playing, personal agenda, and brainstorming; and study of parliamentary procedure for chairing formal meetings. (3F,W,Sp)

324. Methods of Teaching Agricultural Mechanics. Developing an understanding of the organization and management of a school shop. Lesson planning, shop equipment and supplies, skill requirements, and supervised practice. (4F)

325. Methods of Teaching Agriculture. Develops an understanding of organization and management of the agricultural education program. Includes teaching methods, supervised practice, curriculum development, testing, and evaluation as related to education in agriculture. (5F)

344. Compact Equipment. Principles of operation, adjustment, maintenance, and repair of small internal combustion engines and associated equipment. (4Sp)

345. Agricultural Equipment Preventive Maintenance. Performance of preventive maintenance practices on agricultural equipment, and principles involved in overhauling and reconditioning agricultural engines. Prerequisite: ASTE 101 or equivalent. For agricultural education majors only. (3-5W)

360. Agricultural Machinery Management. Principles of agricultural machinery management consisting of factors in lengthening agricultural equipment life and/or purchasing used and new equipment. (3Sp)

362. Future Farmers of America Program Advisement. An activity-centered curriculum to prepare teachers for Future Farmers of America advising. (1F,W,Sp) ®

372. Agricultural Equipment Testing and Diagnosis, Electrical. Techniques in diagnosing malfunctions and related failures will be explored. A system diagnostic method will be developed. (3F)

373. Agricultural Equipment Testing and Diagnosis, Hydraulics. Techniques in diagnosing hydraulic malfunctions and related failures will be explored. A system diagnostic method will be developed. (3W)

374. Agricultural Machinery Systems Analysis. Testing and diagnosis of both gas and diesel tractors with related systems pertaining to implement control. Simple and complex testing techniques will be developed for proper operational adjustments and analyzing malfunctions. (5Sp)

375. Departmental Seminar. Review and discussion of current trends in the discipline. Three credits required for students in the department. (1F,Sp) ®

390. Special Problems in Agriculture Education. Students conduct short-term studies and/or literature review with critical analysis of special topics. Formal written reports required. Prerequisite: approval of instructor. (1-5) ®

400. Electrification in Agricultural Systems. Fundamentals of electricity as used on farms and ranches. Lighting design, electrical safety, wiring, three-phase service, controls, and motors for agricultural applications. Programmable controller applications. (4W)

425. Occupational Experience in Agriculture. Supervised occupational experience for technical and professional preparation in teacher education and/or agricultural business. (3-9F,W,Sp,Su) ®

432. Agricultural Production Systems. Layout and organization of farms and their component operations. Planning livestock production buildings, structures for crop storage, and machinery housing. (4F)

450. Secondary Curriculum Seminar. Studies and reports on research and new developments. One quarter required for all majors in agricultural education. (3F,W)

460. Student Teaching in Secondary Schools. Students will leave the campus for 8 to 11 weeks. (12F,W)

490. Undergraduate Research and Creative Opportunity. (1-5) ®

493. Senior Project. Returning student teachers will work to strengthen their weaknesses in areas such as scaled drawing, cost estimating, machine shop practices, construction, small engines, etc. (1-5) ®

511 (d611)[1]. Vocational Technical Education Program Planning and Evaluation. Program planning and evaluation strategies are studied. Local manpower surveys and evaluation questionnaires are designed. Job analysis as a basis for curriculum planning. (4Sp)

516 (d616). Applications of Agricultural Controls. Theory and application of fluids under controlled pressure in mobile systems. Fundamentals and operating principles of instruments for standard measurement, electronic instrumentation, and control. (4F)

520 (d620). A Systems Approach for Analyzing Agricultural Issues. Case studies of current controversial agricultural systems. National and global ramifications are explored. (3Sp)

526 (d626). Impacts of Agricultural Practices on Water Quality. Relationship between agricultural practices and water quality. Controlling agricultural nonpoint source pollution will also be covered. (3F)

551 (d651). Principles and Practices of Extension Education. In-depth inquiry into the history, philosophy, and organizational structure of the Cooperative Extension Service programming philosophy and methodology and teaching techniques. (3F)

555 (d655). Agricultural Water Supply. Water requirements, supplies, and treatment for domestic and livestock production systems. On-site domestic sewage disposal systems. Livestock waste properties, collection, transport, storage, and treatment. (3F)

Graduate[2]

600. Methods of Equipment Testing, Diagnosis, and Repair. (3Sp)

601. Secondary Agricultural Education Curriculum Development (Ag Mechanics). (1-3Su) ®

602. Secondary Agricultural Education Curriculum Development (Economics). (1-3Su) ®

603. Secondary Agricultural Education Curriculum Development (Range Science). (1-3Su) ®

604. Secondary Agricultural Education Curriculum Development (Entomology). (1-3Su) ®

605. Secondary Agricultural Education Curriculum Development (Plant Pathology). (1-3Su) ®

606. Secondary Agricultural Education Curriculum Development (Animal Science). (1-3Su) ®

607. Program and Curriculum Development in Vocational Education. (1-3F,W,Sp,Su)

610. Supervision in Extension. (3W)

611 (d511). Vocational Technical Education Program Planning and Evaluation. (4Sp)

612. Administration of Extension. (3Sp)

613. Electrical and Hydraulic Component Testing, Diagnosis, and Repair. (3W)

614. Extension Program Planning and Evaluation. (4Sp)

616 (d516). Applications of Agricultural Controls. (4F)

620 (d520). A Systems Approach for Analyzing Agricultural Issues. (3F)

624. Advanced Methods of Teaching Agriculture. (3F)

625. Special Problems in Agricultural Education. (1-5F,W,Sp,Su) ®

626 (d526). Impacts of Agricultural Practices on Water Quality. (3F)

630 (f530). Foundations of Adult Education Programs. (3F)

651 (d551). Principles and Practices of Extension Education. (3F)

655 (d555). Agricultural Water Supply. (3F)

660. Analysis of Machinery Management and Decision Making Processes. (3Sp)

670. Introduction to Research Methodology in Ag Education. (1-3Sp)

675. Agricultural Safety and Health: Issues and Decisions. (3Sp)

690. Agricultural Machinery Technology Research and Application. (3Su) ®

691. Special Problems for Vocational Teachers. (1-5Su)

697. Research and Thesis. (1-9F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-3F,W,Sp,Su) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing; parenthetical numbers preceded by an *f* are the *former* course numbers.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Department of

Animal, Dairy and Veterinary Sciences

College of Agriculture

Head: Professor Robert C. Lamb
Office in Agricultural Science 230, 797-2162

Assistant Head: Professor Mark C. Healey
Office in Veterinary Science and Bacteriology 202, 797-1901

Professors Stanley D. Allen, Clive W. Arave, Clell V. Bagley, Thomas D. Bunch, Roger A. Coulombe, Jr., Lyle G. McNeal, R. Dean Plowman, Robert W. Sidwell, Ross A. Smart, Norris J. Stenquist; **Professors Emeritus** James A. Bennett, John E. Butcher, Jay W. Call, C. Elmer Clark, Grant M. Esplin, Warren C. Foote, Doyle J. Matthews, James LeGrande Shupe, Wallace R. Taylor, Don W. Thomas; **Adjunct Professors** E. Marlowe Goble, Lynn F. James, Nicholas C. Leone, Kanok Pavasuthipaisit, Raghubir P. Sharma, Rex S. Spendlove; **Adjunct Research Professor** Michael R. Marshall; **Associate Professors** W. Craig Burrell, Noelle E. Cockett, Howard M. Deer, Haven B. Hendricks, Nyle J. Matthews, Kenneth C. Olson, Larry M. Slade, Kenneth L. White, Randall D. Wiedmeier; **Associate Professors Emeritus** Donald C. Dobson, Darrell H. Matthews, Charles H. Mickelsen; **Adjunct Associate Professor** Kip E. Panter; **Research Associate Professors** Ronald L. Boman, John D. Morrey, Donald F. Smee; **Research Associate Professor Emeritus** Melvin J. Anderson; **Adjunct Research Associate Professors** Dale R. Gardner, John D. Olsen, John N. Stellflug; **Assistant Professor** G. Reed Holyoak; **Adjunct Assistant Professors** David H. Clark, David D. Frame, John T. Lohr, Kathleen R. Rasmussen, H. Tod Shenton, J. Christopher Wilson; **Research Assistant Professors** Dale L. Barnard, Robert E. Buckner, John H. Huffman, M. Keven Jackson, Jeffrey L. Walters, Shiquan Wang, Shiguang Yang; **Research Assistant Professors Emeritus** Paul V. Fonnesbeck, Leonard C. Kearl, Robert E. Warnick; **Adjunct Research Assistant Professors** Frank L. Barnes, Phillippe Collas, Gary D. Snowder, Bryan L. Stegelmeier, Luz S. Teicher; **Instructors** Parl Galloway, Jonathan W. Merriam, Milan Shipka; **Lecturer** J'Wayne McArthur; **Research Associates** R. Cole Evans, Lee G. Wood

Degrees offered: Bachelor of Science (BS) and Bachelor of Arts (BA) in Animal Science, Dairy Science, Bioveterinary Science; Master of Science (MS) and Master of Arts (MA) in Animal Science, Dairy Science, Bioveterinary Science; Doctor of Philosophy (PhD) in Animal Science; MS and PhD degrees in Toxicology and Molecular Biology are available through the Interdepartmental Toxicology and Molecular Biology programs

Certificate Programs: Dairy Herdsman, Swine Management

Objectives

Bachelor's degree students majoring in animal or dairy sciences may choose a program from three career core areas: (1) Science, (2) Animal (Dairy) Industry, and (3) Animal (Dairy) Management. The curricula in the animal and dairy sciences are designed to prepare students for a broad base of rewarding careers in the dynamic disciplines of animal agriculture. Teaching and research facilities, flocks, and herds are available for "hands-on" practical laboratory experiences, along with faculty-mentored research projects. An assigned faculty adviser helps students develop, arrange, and expedite their personal undergraduate program.

Preveterinary bachelor's degree programs are intended to prepare students for admission to professional veterinary medical schools and/or graduate study in the biomedical sciences. A preveterinary bachelor's degree is considered a nonterminal degree. Preveterinary students may earn a bachelor's degree in bioveterinary science, or in the science core of animal science or dairy science with a preveterinary option.

Instruction in the ADVS Department also encompasses a diversified co-curricular program including allied clubs, intercollegiate livestock judging and rodeo teams, and involvement with their respective professional societies.

Animal and Dairy Sciences

Science Core. Designed for students desiring education beyond the bachelor's degree, this core is a preparatory course of study for students who have a career interest in the following areas: animal research in genetics; reproductive biology, nutrition, behavior, etc. (public or private sector); biotechnology; teaching; and advanced degrees (MS, PhD, and veterinary school). The science core requires an especially close student-adviser relationship, as post-graduate training is considered essential for professional success in these disciplines.

Animal (Dairy) Industry Core. This core offers the greatest number of career opportunities for students with a bachelor's degree in the present field of animal agriculture. Animal industry has the largest sector of employment opportunities both domestically and internationally. In addition to on-campus courses, students in this core will be expected to fulfill a research or internship in industry experience. Students selecting this core prepare for the following careers: corporate agribusiness, wholesale and retail marketing and sales, economics, accounting, agricultural real estate and appraisal, financing and credit operations, public policy, agricultural media or communications, insurance and/or commodity speculation, commodity groups, value-added animal product processors, agricultural cooperatives, and others within the scope of the animal and dairy industries.

Animal (Dairy) Management Core. Animal management reflects the more traditional livestock production management emphasis, yet encompasses a program integrating the principles of ecosystem or holistic management, along with the important desire for the sustainability of the systems utilized. A dependable food supply worldwide is crucial to world economic and population stability. This core is designed to train students in the pragmatic and basic animal sciences, coupled with the relatively new disciplines associated with environmentally-friendly livestock production systems. Students can select either an advanced research project or an internship experience in industry during their junior or senior year. Graduates in this core area gain a basic

background suitable for a career in the areas of ranch or farm management, state and federal government agricultural agencies, agroecology, sustainable agriculture, or cooperative extension work domestically and internationally.

Preveterinary Program

Preveterinary students take courses required by veterinary schools. Classes should be planned to assure meeting the current requirements for the veterinary schools to which the student plans to apply for admission. In most cases, preveterinary preparation requires a major portion of three academic years. Students accepted into veterinary school prior to completion of their BS degree may transfer credits back to USU for completion of their BS degree in bioveterinary science.

Utah participates in WICHE (Western Interstate Commission for Higher Education) which provides state subsidization of Utah resident (5 years or longer at the time of application) students entering any veterinary school that is a WICHE-participating school. At present this includes Colorado State University, Washington State University, Oregon State University, and University of California at Davis. Students may also apply to other veterinary schools as out-of-state applicants.

Vocational Subbaccalaureate Programs

Dairy Herdsman Certificate. Students completing the required courses and experience in the Dairy Herdsman's curriculum usually find employment with a commercial or family dairy. Some enter dairy-related businesses. Students desiring to continue their dairy education may complete a BS degree in three additional years with proper planning and suitable academic performance.

Swine Management Certificate. Students completing the required courses and experience in the Swine Management curriculum will be eligible for employment in the expanding Utah swine industry. This program represents a joint venture between USU and Circle Four Farms in Milford, and consists of two quarters on campus and two quarters in Milford.

Requirements

Departmental Admission Requirements. Undergraduate admission requirements for the animal science and dairy science programs are the same as those described for the University. Students in good standing may apply for admission to the department. New freshmen admitted to USU in good standing qualify for admission to the bioveterinary science major. Students with less than 90 credits transferring from other institutions need a 2.2 transfer GPA, and students with less than 90 credits transferring from other USU majors need a 2.0 GPA for admission to the bioveterinary science major. All students with 90 or more credits need a 2.75 total GPA to be admitted to advanced standing in bioveterinary science.

Departmental Standards. The following minimum requirements apply to all students working toward any bachelor's degree offered by the ADVS department. Bachelor's degree candidates must comply with these requirements in order to graduate: (1) courses required for the major may be repeated only once to improve a grade, and (2) courses required for the major may not be taken for pass-fail credit. In addition to these requirements, animal science and dairy science bachelor's degree candidates must attain a grade point average of 2.25 in the ADVS courses specified as core requirements in their respective curricula. Bioveterinary science degree candidates must attain an overall GPA of 3.0.

Academic Advising. Successful completion of a bachelor's degree program in the ADVS Department requires that a very close student-academic adviser relationship be established and continued through each student's bachelor's degree program. Each student must take the responsibility of establishing this close working relationship with his or her adviser. Doing this soon after the student's entry into the department can keep academic problems to a minimum.

Graduation Requirements

Courses required and recommended for meeting BS degree graduation requirements in the various options available in the department are as follows:

Animal/Dairy Science: Science Core

The following courses are required for students pursuing a bachelor's degree in the animal science or dairy science Science Core: ADVS 108, 111, 120, two 200-level species production practices courses (A), 213 (D), 251, 300, 302, 316, 350, 351, 420, 421, 435, 456, 457, 480, 491, 492, two 500-level species management courses (A), 513 (D); ASTE 309; Biol 125, 126, 127, 319; BIS 140; Chem 121, 122, 123, 124, 231, 232, 233, 234, 370; Engl 101 or 111; Engl 200 or 201; Engl 305 or ASTE 305; Math 105, 106; Micb 301; Spch 105; Stat 301. Optional recommended courses are ADVS 516, 524, 526; Chem 371; Math 215; Phyx 111.

Animal/Dairy Science: Industry Core

The following courses are required for students pursuing a bachelor's degee in the animal science or dairy science Animal (Dairy) Industry Core: ADVS 108, 111, 120, 125, three 200-level species production practices courses (A), 213 (D), 251, 300, 330, 350, 351, 365, 420, 421, 425, 435 (D), 456, 457, 491, 492, two 500-level species management courses (A), 503, 513 (D); ASTE 309, 310; Biol 101; BIS 140; Chem 111, 141; Econ 200; Engl 101 or 111; Engl 200 or 201; Engl 305 or ASTE 305; Math 101 or 105; NFS 340 (D), 345 (A); Soil 200; RLR 300 (A); Spch 105; Stat 201 or 230 or 301. In addition, students in the animal science or dairy science Industry Core must choose four courses from the following: Acct 201; Econ 201, 303, 402, 403, 503; MHR 299, 311.

Animal/Dairy Science: Management Core

The following courses are required for students pursuing a bachelor's degree in the animal science or dairy science Animal (Dairy) Management Core: ADVS 101 (D)*, 108, 111, 120, 125*, three 200-level species production practices courses (A), 213 (D)*, 251*, 300, 330, 350, 351*, 365, 420, 421*, 425* or 480*, 435 (D), 456, 457, 491, 492, two 500-level species management courses (A), 503, 513 (D), 585 (A); ASTE 201, 309, 310*, 551*; Biol 101; BIS 140; Chem 111, 141; Econ 200; Engl 101 or 111; Engl 200 or 201; Engl 305 or ASTE 305; FW 300 (A); Math 101 or 105; NFS 340 (D), 345 (A); Soil 358; PlSc 430 or 432; RLR 284, 300 (A); Spch 105; Stat 201 or 230 or 301.

(A) Required of Animal Science majors.

(D) Required of Dairy Science majors.

*Not required for students who have completed the Dairy Herdsman Certificate Program (Dairy Management Core only).

Bioveterinary Science

This plan includes those courses required for application to WICHE veterinary schools after three years. Requirements are as follows:

Freshman year: Engl 101; Math 105 (students with inadequate math preparation should take Math 101 instead of Math 105), Math 106; Chem 111, 121, 122, 124; ADVS 108, 111, 120, 192; BIS 140.

Sophomore year: Chem 231, 232 and 234, 370 and 371; Biol 125, 126, 127; ADVS 292; Stat 201; 6 credits of Humanities electives; Econ 200 or Hist 170 or PolSc 110; 5 credits of Social Science electives.

Junior year: Phyx 111; Biol 319; Engl 200 or 201; Micb 301; ADVS 251, 300, 302, 420, 421, 549; 3 credits of Humanities electives; 12 credits of other electives.

Senior year: ADVS 350, 351, 569, 570, 571; Engl 301 or 305 or ASTE 305; Zool 555; 0 credits other electives. Methods in Biotechnology courses (ADVS 516, 524, 526) are highly recommended.

BA Degree in Animal/Dairy/Bioveterinary Science

Students must complete requirements for the BS degree in these respective programs (see above), plus two years of a foreign language (see page 18 of this catalog).

Honors

There is also an Honors Plan for students desiring a BA or BS degree "with Honors" in Animal/Dairy/Bioveterinary Science. For details, students should contact their academic adviser.

ADVS Minors

A minor can be valuable when associated with a major in agricultural education, agricultural economics, plant science, nutrition and food science, business, economics, computer science, range science, and in other disciplines where the animal industry has direct or indirect involvement.

Requirements for specialty or emphasis area minors are listed below. The same departmental standards applying to animal science and dairy science majors also apply to all minors (see page 68).

Requirements for Minors

The following is a listing of courses for the various minor emphasis areas. A specific course may **not** be used to fulfill the requirements of more than one ADVS minor.

General Animal Science: ADVS 111, 245, 246; choose one or more courses from ADVS 208, 209, 212, or 219; 12 elective ADVS credits, with approval of an animal science adviser.

General Dairy Science: ADVS 111, 213, 245, 246; 12 elective ADVS credits, with approval of a dairy science adviser.

Bioveterinary Science: ADVS 120, 300, 420; supporting elective ADVS credits, for a total of at least 18 credits with approval of a bioveterinary science adviser.

Swine Production: ADVS 111, 212, 225 (coop experience with swine), 245, 246, and 271 for a total of at least 19 credits.

Beef Production: ADVS 111, 208, 225 (coop experience with beef), 245, 246, and 271 for a total of at least 19 credits.

Horse Production: ADVS 111, 165, 219, 225 (coop experience with horses), 245, and 246 for a total of at least 19 credits.

Horse Training: ADVS 111, 165, 219, 265; 5 elective credits chosen from ADVS 166, 225 (coop experience with horses), 266, 301, or 390.

Animal Genetics: ADVS 111, 456, 457; Biol 125; Stat 201.

Animal Nutrition: ADVS 111, 251, 350, 351 (ruminant), and 351 (nonruminant); select one of ADVS 208, 209, 212, 213, or 219.

Domestic Animal Reproduction: ADVS 101, 111, 120, 420, and 421.

Sheep and Wool Production: ADVS 111, 129, 209, 225 (coop experience with sheep/wool), 245, 246, 271, 309 for a total of at least 19 credits.

Companion Animal: ADVS 121, 130, 245, 246, 366; Psy 140; at least 3 credits chosen from one of the following: ADVS 225, 425, 480.

Dairy Herdsman: ADVS 102, 103, 104, 105, 109, 213; ASTE 200. (Not available to Dairy Science majors.)

Transfer students must have a minimum of one 3-credit upper-division course in residency with the approval of an ADVS adviser.

Safety and Liability in Classes and Laboratories

Certain classes and laboratories involve a risk of bodily injury or of damage to clothing. Students should take appropriate precautions and wear suitable protective clothing. Some of the risks include handling or being near animals, slick floors or corrals, use of toxic or corrosive substances, and the use of sharp or breakable instruments and equipment. Students should take precautions to avoid fainting during demonstrations or work with animal tissues or operative procedures. Students must assume their own liability protection for travel to and from classes, laboratories, and field trips. The University and its employees assume no liability in the performance of classroom or laboratory instruction or on scheduled field trips, or for other dangerous activities. The student, by voluntarily participating in these classes and activities, agrees to assume the risk and not hold USU or its staff liable.

Financial Support

In addition to the scholarships and other financial aid available through the University, the department awards designated scholarships to qualified students (for details, refer to Scholarships and Awards in the College of Agriculture in the Financial Aid section of this catalog). The department employs students on a

part-time basis to assist with its research and operate its animal facilities. The department also coordinates cooperative education and internship employment opportunities for students.

Graduate Studies

Master's (MS) and doctorate (PhD) degrees are offered in specialized professional fields of study. Nutrition, breeding, reproductive physiology, toxicology, molecular biology, management (including animal behavior) are among those disciplines offered within the department and jointly with other departments on campus. An MS degree is also offered in Bioveterinary Science. For further details, see the Utah State University *Graduate Catalog*.

See the Interdepartmental Toxicology Program or Interdepartmental Molecular Biology Program for details on graduate studies in toxicology or molecular biology.

ADVS Courses

101. Artificial Insemination of Dairy Cattle. Principles of reproduction, artificial insemination, and the handling of semen. Anatomy and physiology of the bovine reproductive tract and reproductive management. Practice in artificial insemination. (3F)

102. Dairy Cattle Nutrition and Feeding. Nutrients, feeds, digestion, and utilization by dairy animals. Feeding practices. (4F)

103. Lactation and Milking Systems. The mammary gland, udder health, mastitis and its control. Effect of milking equipment on lactation. Milk quality and marketing. (4W)

104. Dairy Herd Records. Record keeping systems, tax records, estate planning, DHI records. Principles of credit and finance, and loan sources. (4Sp)

105. Dairy Cattle Genetics and Breeding. Principles of dairy genetics, mating, pedigrees, and breeding. Purebred cattle, type traits, and classification. (4W)

108. Introduction to Animal Agriculture. Introduction to the professions and opportunities in animal agriculture, nationally and internationally, and the Animal, Dairy and Veterinary Sciences Department. (1F)

109. Dairy Herd Health. Herd health, diseases, disease prevention and treatment. Working with a veterinarian in setting up a herd health program. (2Sp)

110. Small Scale Animal Production. Fundamentals of raising farm animals in a semi-rural, noncommercial setting. Considerations of feeding, breeding, housing, marketing, sanitation, general health care, and community zoning factors. For nonmajors. (3W)

111. Introduction to Animal Science. The influence and contributions of animal production and its commodities to society. Introductory scientific principles of animal science, livestock production systems, and contemporary issues. (5F,W)

112. Fitting and Showing Dairy Cattle. Fitting, grooming, feeding, and showing dairy cattle at regional and state shows. (1Sp)

114. Applied Feeding and Management of Dairy Calves. Practical experience in feeding and management of calves from birth to weaning. Students will be required to design a calf raising program and carry this program out during the quarter. (2Sp)

115. Swine Health Management. Identification, prognosis, symptoms, and treatment of swine diseases, including development of a herd health management schedule. (3F)

116. Swine Breeding, Genetics, and Artificial Insemination. Genetic influences affecting swine performance and the application of selection principles, breeding systems, and methods of swine improvement. (3Sp)

117. Swine Records and Analysis. Students will establish swine production goals and develop a swine production record keeping system, including all reports, performance efficiencies, and computer applications in record keeping. (4W)

119. Swine Production Systems. Identification of different types of production systems and factors affecting growth and performance of hogs in controlled environments (i.e., ventilation rates, building materials, and equipment). (3Sp)

LS 120. Anatomy and Physiology of Animals. Normal structure and function studied systematically. Comparative livestock, poultry, pleasure and companion animals, laboratory animals, and man. A basic biology course. Four lectures and one lab. (5Sp)

121. Companion Animals. The science of companion animals (horses, dogs, cats, etc.), including bonding behavior, nutrition, environment, reproduction, and breeding. (2Sp)

122. Companion Animal Health. Consideration of the health aspects of breeding, raising, and maintaining companion animals (horses, dogs, cats, etc.). (2Sp)

125. Applied Agricultural Computations. Intended to develop understanding and proficiency in the application of mathematical skills to practical computations required in agricultural science. (3F,Sp)

129. Elements of Sheep Shearing. Laboratory course with emphasis on wool harvesting technology: sharpening of combs and cutters, operation of equipment, shearing procedures, proper handling of sheep and the fleece. Lab fee. Prerequisite: permission of instructor. (1Sp)

IO 130. Domestic Animals and Mankind. Integration of historical and current perspectives on interactions between humans and domestic animals with consideration of their biological, economic, social, esthetic, and ethical significance. (5F,Sp)

165. Western Horsemanship I. Grooming, saddling, bridling, mounting, seats and hands, horseback riding both bareback and on western saddle. For students with limited or no previous riding experience. Three labs. Western-type riding boots and health insurance required. Lab fee. (3F,Sp)

166. Horse Judging, Fitting, and Showing. Judging halter and performance horse classes. Fitting and showing horses at halter. Lab fee. (3W)

172. Dairy Cattle Evaluation and Judging. Introduction to evaluation and selection of dairy cattle. Selection of functional type in commercial operations is emphasized. (1W)

192. Introduction to Veterinary Medicine. Introduction to the profession of veterinary medicine and preparation for a veterinary medical career. (1W)

208. Beef Production Practices. Production practices in the handling, selection, and care of beef cattle. Demonstrations of equipment, facilities, and skills relevant to beef cattle production. One lecture, one lab. Prerequisite: ADVS 111 or concurrent enrollment. (3Sp)

209. Sheep Production Practices. Production practices in the handling, selection, and care of sheep. Demonstrations of equipment, facilities, and skills relevant to sheep and wool production. One lecture, one lab. Prerequisite: ADVS 111 or concurrent enrollment. (3Sp)

212. Swine Production Practices. Production practices in the selection, handling, and care of swine. Demonstrations of equipment, facilities, and skills relevant to swine industry. One lecture, one lab. Prerequisite: ADVS 111 or concurrent enrollment. (3W)

213. Dairy Production Practices. Production practices in the selection, handling, and care of dairy animals. Demonstrations of equipment, facilities, and skills relevant to the dairy industry. One lecture, one lab. Prerequisite: ADVS 111 or concurrent enrollment. (3F)

219. Horse Production Practices. Production practices in the selection, care, and handling of horses. Demonstrations of equipment, facilities, and skills relevant to horse production. Two lectures, one lab. Prerequisite: ADVS 111 or concurrent enrollment. (3F) ©

225. Cooperative Work Experience. For students who require animal industry experience to prepare them for advanced curriculum in the Animal, Dairy, or Veterinary Sciences. (1-12F,W,Sp,Su) ®

245. Animal Feeds and Feeding Practices. Feed composition and characteristics which influence animal performance. Digestion of feeds and nutrient utilization by animals. Emphasis on diet formulation and feeding practices. Three lectures. (3Sp) ©

246. Applied Animal Feeds and Feeding. Ration formulation and feeding strategies. Special consideration given to feeding practices for ruminants and nonruminants in separate laboratory sections. Prerequisite: ADVS 245 or concurrent registration. (2Sp) ®

251. Animal Feeds. Physical and chemical characteristics of animal feeds and factors which influence animal performance. One lab. (1Sp)

265. Western Horsemanship II. Different training techniques for western pleasure and western reining horses, teaching leads, cueing techniques, reining maneuvers, and show-style riding. Three labs. Prerequisite: ADVS 165 or equivalent. Western-type riding boots and health insurance required. Lab fee. (3F,Sp)

266. Horse Packing. Practical experience in selecting horses and equipment for pack trips, and in safety principles and in tying hitches. Lab fee. (2W)

271. Farm Animal Evaluation and Judging. Evaluation of type and breed characteristics of domestic farm animals utilized for meat production. Judging, grading, and oral reasons will be emphasized. One lecture, two labs. (3F)

292. Orientation to Veterinary Medicine. Preparation of preveterinary students for successful application and admission to professional veterinary schools. (1Sp)

300. Animal Health, Hygiene, and Parasitology. Introduction to basic principles of disease. The agents, mechanisms, and preventive measures for common diseases and parasites of farm animals will be emphasized. Three lectures, one lab. Prerequisite: ADVS 120. (4F)

301. Fundamentals of Horse Breaking. Utilization of current training methods relating to basic Equine behavior, ground breaking skills, and riding and training of the unbroken horse. Three labs. Prerequisite: ADVS 265 or equivalent. Lab fee. (3F,Sp)

302. Biotechnology in Agriculture. Introduction to agricultural biotechnology, including genetics, reproduction, veterinary and human medical aspects, and social, legal, and ethical issues surrounding biotechnology. Prerequisites: Biol 125, 126, 127, and organic chemistry course. (3F)

****309. Wool Judging and Evaluation.** Terminology, physical characteristics, and visual grading of wool. Factors associated with the market value of the unprocessed fleece. Judging and oral reasons. One lab. (1Sp)

316. Methods in Biotechnology: Basic Principles. A laboratory intensive course designed to provide a foundation in basic methods in biotechnology, including cell growth, and isolation and characterization of protein and DNA. (3F,Sp)

IO 330. Animal Production and Public Policy. Contemporary forces in society which influence the ability of farmers and ranchers to produce livestock and livestock products. (3W)

350. Principles of Animal Nutrition. Biochemistry and utilization of the nutrients for maintenance and productive functions; feedstuff composition and its analysis; major nutritional diseases affecting farm animals. Prerequisites: Chem 141 or concurrent registration, ADVS 120 or equivalent. (5F)

351. Applied Animal Nutrition. Principles of animal nutrition applied to ration formulation and feeding strategies; special consideration given to differences in feeds used and feeding practices for each specie (beef and dairy cattle, sheep, swine, and horses). One lecture, one lab. Prerequisites: ADVS 251, 350. (2W) ®

365. Live Animal and Carcass Evaluation. Judging, grading, and pricing of market animals and carcasses, where live vs. carcass evaluation will be stressed. Advanced judging of breeding animals included. (4W)

****366. Behavior of Farm Animals.** Applicability of behavioral principles to management of domesticated farm animals of economic importance to man. Two lectures, one lab. (3Sp)

371. Livestock Judging Contests. Advanced methods of selection and identification of superior animals for breeding stock; performance records; oral reasons; participation in livestock judging contests. Prerequisite: ADVS 271. (1-2F,Sp) ®

390. Special Problems and Readings. Students conduct short-term studies and/or literature review with critical analysis of special topics. Formal written reports required. Prerequisite: approval of instructor. (1-3F,W,Sp,Su) ®

391. Special Topics. Topics of special interest to those who have needs not satisfied by courses currently offered. (1-5F,W,Sp,Su) ®

392. Internship in Veterinary Medicine. A directed and evaluated educational work experience with a veterinary medical practice. Prerequisite: permission of internship adviser. (1-6F,W,Sp,Su) ®

420. Principles of Reproductive Physiology. An introduction to the principles of physiology as they relate to the reproductive processes in animals. Prerequisites: ADVS 120, or Physl 130, and organic chemistry. (3W)

421. Applied Reproductive Physiology. A presentation of factors affecting and methods of measuring reproductive performance in farm animals (beef and dairy cattle, sheep, swine, and horses) and their application in analysis and evaluation and management of reproduction. One lecture, one lab. Prerequisite: ADVS 420. (2Sp) ®

425. Internship in Animal Industry. A directed and evaluated educational work experience in an animal production unit, related business, or government facility in cooperation with the Livestock Education Foundation. Prerequisite: permission of internship adviser. (1-12F,W,Sp,Su) ®

***435. Lactation of Farm Animals.** Anatomy and function of mammary glands. Milk as a food for young animals and commercial markets. Factors affecting milk quantity and quality. Milking machine operations. Prerequisite: organic chemistry and ADVS 120. (3W)

456. Principles of Animal Breeding. Genetic influences affecting animal performance and the application of selection principles, breeding systems, and methods for improvement of farm mammals. Prerequisite: Biol 101 or 125 or equivalent. Three lectures, one lab. (3F) ©

457. Applied Animal Breeding. Application of genetics and animal breeding practices to the principal species of farm animals (beef and dairy cattle, sheep, swine, and horses). One lecture, one lab. Prerequisite: ADVS 456. (2F)

480. Undergraduate Research or Creative Opportunity. Research or creative activity pertaining to animals. May include management, production, medical, or basic science; and consider biological, chemical, or physical aspects, or instrument design. Prerequisite: permission of instructor. (1-6F,W,Sp,Su) ®

491. Preprofessional Orientation. Survey of the professional opportunities in the animal industries, with emphasis on contacts with industry leaders and preparation for employment. Prerequisite: upper-division standing. (1W)

492. Undergraduate Seminar. Current development in the selected field of the student. Each student is responsible for the research and oral presentation of a topic in the animal industry. Prerequisite: senior standing or permission of instructor. (2F) ®

503. Sustainable Agriculture Production Systems with Animals. Study of various domestic animal production systems in relation to sustainable agriculture and integrated ranch and farm management strategies. Considerations of environmental factors and overall profitablity. Prerequisite: ADVS 111. (3W)

508 (d608)[1]. Beef Cattle Management. Managing the beef enterprise to yield optimum returns through integrating resource use and applying breeding, nutrition, reproduction, and animal health practices. Three lectures, one lab. Prerequisites: ADVS 208, 351, 421, 457; or instructor's consent. (4F)

509 (d609). Sheep Management and Wool Technology. Detailed study of the managerial considerations for range and farm flock operations. Examination of wool and a review of wool clip handling and merchandising. Three lectures, two labs. Prerequisites: ADVS 209, 351, 421, 457; or instructor's consent. (5Sp)

512 (d612). Swine Management. Management decisions based on nutrition, breeding, programs, herd health practices, herd records, and marketing opportunities. Three lectures, one lab. Prerequisites: ADVS 212, 351, 421, 457; or instructor's consent. (4Sp)

****513 (d613). Dairy Cattle Management.** Evaluating dairy herds and planning for future improvements, using management records on herd performance, individual student oral and written reports. Two lectures and one lab. Prerequisites: ADVS 213, 351, 421, 457; or instructor's consent. (4W)

516. Methods in Biotechnology: Cell Culture. Laboratory-intensive course in basic and applied methods of culturing cells (mammalian, insect, plant) and methods of fusing and transforming cells. Prerequisites: Biol 125 or ADVS 316 or equivalent, or permission of instructor. (3W)

519 (d619). Horse Management. Management decisions in horse enterprises with emphasis on records, nutrition, breeding, health, facilities, and merchandising. Three lectures, one lab. Prerequisites: ADVS 219, 351, 421, 457; agricultural economics; or instructor's consent. (4W)

524. Methods in Biotechnology: Protein Purification Techniques. Laboratory-oriented course designed to provide basic knowledge in protein purification, analysis, and its scale up. Prerequisites: Chem 370 or ADVS 316, or permission of instructor. (3Sp)

526. Methods in Biotechnology: Molecular Cloning. Laboratory-oriented course in molecular cloning techniques such as DNA cloning, genetic probes, PCR, DNA sequencing. Prerequisites: Chem 370 or Biol 319 and Micb 301 or equivalent, ADVS 316, or permission of instructor. (3F)

540 (d640). Environmental and Industrial Toxicology. Study of toxic chemicals present in general or industrial environment. Emphasis on biologic effects, associated problems, and possible solutions. Prerequisite: Chem 370 or instructor's consent. (4Sp)

549 (d649). Research Animal Techniques. Required for authorization to utilize in USU research those species of animals named in the Animal Welfare Act. Includes proper methods of animal care and research techniques. (1F,W,Sp) ®

****553 (d653). Nutritional Management of Ruminants.** Nutritional management, problem solving, and feeding strategies as they influence animal performance. One lecture, two labs. Prerequisites: ADVS 508, 509, or ADVS 513. (3W)

***554 (d654). Nutritional Management of Nonruminants.** Nutritional management, problem solving, and feeding strategies as they influence animal performance. One lecture, two labs. Prerequisites: ADVS 512 or 519. (3W)

***559 (d659). Wool Science.** Biology of fiber growth: Histology, fiber arrangement, morphology, and fleece genetics. Environmental and physiological factors affecting wool growth. Prerequisite: Biol 101 or 125 or equivalent. (3Sp)

569 (d669). Animal Histology. Introduction to the microscopic anatomy of normal, domestic animal cells, tissues, and organs. Three two-hour lectures/laboratories each week. Prerequisite: ADVS 120 or permission of instructor. (5F)

570 (d670). General Pathobiology. Principles of structural and functional mechanism of abnormal reactive processes in animals. Three lectures, two labs. Prerequisite: ADVS 569. (5W)

571 (d671). Special Pathobiology. Correlates abnormality with causes; disease processes studied by systems, organs, and cells. Three lectures, two labs. Prerequisite: ADVS 570. (5Sp)

****582 (d682). Animal Cytogenetics and Methods in Cell Culture and Chromosome Banding Techniques.** Structure and properties of chromosomes, chromosome behavior during cell division, chromosomal influence on the phenotype, and factors that cause chromosomal change. Emphasis on clinical problems affecting man and livestock. Two lectures, one lab. (3Sp)

***585 (d685). Range Livestock Nutrition and Management.** Principles of livestock nutrition and production applied to the grazing environment and the relationships of livestock and range management for optimizing values from both. Prerequisites: RLR 300, ADVS 351. (3W)

****586. Poisonous Range Plants Affecting Livestock.** Poisonous plants of rangelands and their effects on grazing animals, especially livestock. Management practices to reduce or prevent poisoning. (3W)

Graduate[2]

601. Animal Research Orientation. (1F)

608 (d508). Beef Cattle Management. (4F)

609 (d509). Sheep Management and Wool Technology. (5Sp)

612 (d512). Swine Management. (4Sp)

613 (d513). Dairy Cattle Management. (4W)

619 (d519). Horse Management. (4W)

****620. Physiology of Reproduction.** (4Sp)

***630. Animal Breeding Theory.** (5W)

635. General Pharmacology. (3W)

640 (d540). Environmental and Industrial Toxicology. (4Sp)

649 (d549). Research Animal Techniques. (1F,W,Sp) ®

****650. Animal Nutrition Laboratory.** (2F)

***651. Techniques in Nutrition Research.** (2W)

****653 (d553). Nutritional Management of Ruminants.** (3W)

***654 (d554). Nutritional Management of Nonruminants.** (3W)

***655. Rumen Physiology and Metabolism.** (3F)

***659 (d559). Wool Science.** (3Sp)

***660. Principles of Toxicology.** (4Sp)

***662. Molecular and Biochemical Toxicology.** (3F)

669 (d569). Animal Histology. (5F)

670 (d570). General Pathobiology. (5W)

671 (d571). Special Pathobiology. (5Sp)

680. Animal, Dairy and Veterinary Science Seminar. (1F,W,Sp) ®

681. Seminar in Toxicology. (1W,Sp) ®

****682 (d582). Animal Cytogenetics and Methods in Cell Culture and Chromosome Banding Techniques.** (3Sp)

***685 (d585). Range Livestock Nutrition and Management.** (3W)

690. Special Problems. (1-9F,W,Sp,Su) ®

691. Readings and Conference in Pharmacology and Toxicology. (1-5F) ®

697. Research and Thesis. (1-12F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

****752 (f652). Animal Energetics and Nutrient Metabolism.** (3W)

****756 (f656). Mineral Metabolism.** (3Sp)

***757 (f657). Vitamins in Nutrient Metabolism.** (3Sp)

797. Dissertation Research. (1-12F,W,Sp,Su) ®

799. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing; parenthetical numbers preceded by an *f* are the *former* course numbers.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

*Taught 1996-97.

**Taught 1997-98.

Department of
Art
College of Humanities, Arts and Social Sciences

Head: Associate Professor Marion R. Hyde
Office in Fine Arts Visual 120, 797-3460

Professors Jon I. Anderson, Glen L. Edwards, Craig Law, Adrian Van Suchtelen; **Professors Emeritus** R. T. Clark, Harrison T. Groutage, Ray W. Hellberg, Jessie Larson, Gaell Lindstrom, Twain C. Tippetts; **Associate Professors** John Neely, Christopher T. Terry, Susanne J. Warma; **Assistant Professors** Sara J. Northerner, Lauren Schiller, Gregory Schulte, Janet Shapero, Thomas E. Toone; **Assistant Professors** Jane Catlin, Alan Hashimoto

Degrees offered: Bachelor of Arts (BA), Bachelor of Science (BS), Bachelor of Fine Arts (BFA), Master of Arts (MA), and Master of Fine Arts (MFA) in Art

Areas of specialization: Advertising Design, Art Education, Art History, Ceramics, Drawing, Graphic Design, Illustration, Painting, Photography, Printmaking, Sculpture

Objectives

The Department of Art offers a variety of courses carefully selected to prepare art students to become professional in both their thinking and exhibited skills as teachers or as practicing artists. The department also provides service courses for other students to help them become more creative in their thinking, selective in choice making, and cultured in their attitudes.

Requirements

Departmental Admission Requirements

Students accepted in good standing by the University may apply for admission to the Department of Art. Candidates for the BA and BS degrees must maintain a 2.5 minimum GPA in all art classes. No grade less than a *C* is accepted in any art class. The Bachelor of Fine Arts degree requires a 3.0 overall average in art classes, including nothing lower than a *B* in emphasis classes, *and a group senior show*. A description of requirements for the various degrees and art emphasis areas follows.

Bachelor of Arts Degree

Art majors should complete the majority of General Education lower-division requirements, the modern language requirement of 25 credit hours, and the foundations and basic core curriculum by the end of the sophomore year. This will allow concentration in an area of specialization during the junior and senior years. The foundation curriculum is as follows: Art 102, 107, 120, 160, 275, 276, and 277. Art 102 and 120 are fundamental prerequisites and should be completed before registering for other studio classes.

In addition, art majors must complete requirements for one of the specialties listed as areas of emphases plus courses as outlined by the adviser and/or head of the department. The major professor may also prescribe other courses to serve the particular needs of different students. A minimum of 70 credits in art is necessary for this degree.

Bachelor of Science Degree

The Bachelor of Science degree has the same requirements as the Bachelor of Arts with the exception that there is no foreign language requirement.

Bachelor of Fine Arts Degree

The BFA is a professional art degree requiring above-average accomplishment in art. Only students demonstrating considerable promise will be accepted for this more demanding professional degree.

All BFA students must complete the foundation and basic core, as listed in the current requirement sheet, for the BA and BS degrees. Because basic core requirements may vary, according to the particular emphasis area chosen, students should consult an adviser for appropriate course selections.

A minimum 3.0 grade point **average** in the foundation and basic core and a minimum of 3.0 in **each** emphasis class is required. Emphasis classes can be retaken for a higher grade. A minimum of 80 credits, including 18 credits of Art History; and BFA exhibition (spring quarter), must be completed for the BFA degree.

The General Education lower-division requirements and most of the basic core curriculum, especially Art 102 and 120, should be completed by the end of the sophomore year. This will allow concentration in an area of specialization during the junior and senior years.

Art Minor Requirements

The requirements for a minor in art are flexible and can be completed in most areas of specialization.

Generally, the minimum requirements include Art 102, 120, 160, plus three credits from the art history group (Art 101, 275, 276, and 277), and 12-15 credits in a specialization area.

USU does not offer an art teaching minor for secondary teachers. Students choosing to train for teaching art in secondary schools must complete the art education major listed under art specialties and must comply with all requirements listed by the Department of Secondary Education.

Art History Minor Requirements

A minor in art history requires Art 275, 276, 277, plus 18 credits from the art history group (Art 386, 387, 388, 474, 475, 481, 482, 483, 484, and 589).

Emphasis Areas

Art History. The requirements for a BA in Art History are as follows: 72 credits of coursework in the major with a 2.5 grade point average required for graduation. Basic coursework (39 credits) is to be completed within the first eight quarters and includes Art 101, 102, 120, 160, 275, 276, 277; Phil 215; Hist 104, 105, 170. Advanced courses (33 credits) should be selected from Art 386, 387, 388, 474, 475, 478, 481, 482, 483, 484, and 589.

Five quarters of one or three quarters each of two foreign languages (French or German preferred) are required. A minor in a related area or specific courses chosen in consultation with the adviser is also required.

Ceramics. Contemporary ceramics represents the extension and synthesis of clay sculpture and vessel traditions. Students are acquainted with the technology of ceramic materials and firing processes while developing sound craftsmanship as a means to personal expression. Enrichment is provided through the ceramics collection of the Nora Eccles Harrison Museum, numerous ceramics exhibitions, and visiting guest artists. Juniors and seniors in the program may compete for one of the Ellen Stoddard Eccles Scholarships, an endowed scholarship fund set aside especially for undergraduate ceramics majors.

Drawing. Drawing is the two-dimensional study of form and space, the exploration of drawing media, graphic elements, and visual dynamics. It is an essential discipline for all artists, as it provides the fundamental visual skills needed in their search for a personal idiom. At the same time, drawing itself is also a vehicle of creative expression, visual adventure, and self-discovery.

Painting. Painting concerns an analysis and utilization of all historical approaches to painting, and the exploration of new ideas, techniques, and materials to make new personal contributions. Students are not required to follow any one approach to painting but are encouraged to develop and express individuality.

Photography. Photography is one of the most recent fine art forms. It is broadly used in contemporary life, and the student will become acquainted with all areas of both applied and aesthetic concerns. The fundamentals of craft are carefully taught, so that the student will be able to contribute positively to the field and have employable skills after graduation.

Printmaking. Printmaking is concerned with the process of the artistic creation of the print, the creation of the matrix (wood, copper, stone), and with the printing. Printmaking majors will be introduced to the three major media: intaglio, lithography, and relief printing. Students then spend as much time as possible developing a personal artistic image in a single, chosen medium.

Sculpture. Sculpture is the study of three-dimensional form and space and the exploration of various media. Critical to the sculptor is a feel for visual dynamics and its application to personal expression. An understanding of drawing and design is a necessary prerequisite to the development of ideas. The sculptor must also have the technical expertise to fulfill personal expectations.

Advertising Design. Advertising Design emphasizes concept and layout, along with proficiency in design, thinking, and production methods. Each student will prepare a portfolio of work to show prospective employers his or her ability to produce tasteful and imaginative solutions to advertising problems. This is one of the most vital areas of art, as it is through the creative work of successful designers that products are advertised and sold.

Illustration. Illustration is the art of graphic communication. Students become competent draftsmen and painters and must understand perspective, anatomy, and graphic techniques. The student develops skills to research problems, create compositions that communicate empathy to the viewer, and interpret emotions to provide successful illustrations. A portfolio will be prepared to show to art studios for prospective employment, or the illustrator can work as a free-lance artist.

Graphic Design. Students become competent in hand lettering, trademark design, corporate design, package design, editorial layout and design, poster design, and designed illustrations. A portfolio is prepared to show to design studios for prospective employment in graphic design, such as a package design studio, design studio, art director for a magazine, or free-lance design and illustration. Many students combine this emphasis with Advertising Design or Illustration.

Art Education. Students who wish to pursue a teaching credential for art in the secondary schools should make that choice as soon as possible in their college planning. Students must be interviewed by the appropriate faculty member in the Art Department and must be registered with the College of Education for admission to this program.

The Art Education student may pursue a BA, BS, or BFA degree. The BA and BS degrees require 78 credits (the minimum for certification). The BFA requires 82 credits including an additional 9 credits of Art History beyond the core requirement.

A minimum of 24 credits are to be taken as a specialization area in art.

See the Education Major Requirement Sheet, available from the Art Department, for specific course requirements.

Art Work

The Art Department faculty reserves the right to retain any student works of their choice for purpose of display, exhibition, and addition to the permanent collection.

Graduate Study

The Department of Art offers two graduate degrees and cooperates with the College of Education on another degree. The Master of Arts (MA) and the Master of Fine Arts (MFA) are offered by the Art Department. A Master of Education (MEd) with a specialization in art is offered through the College of Education.

See the *Graduate Catalog* for prerequisites and further information.

Art Courses

HU 101. Exploring Art. An introduction to the interesting variety of visual art forms which will help students develop an understanding of basic art elements and fundamental art principles. (3F,W,Sp) ©

102. Two-dimensional Design. Basic art elements with projects in two dimensions. Required of art majors. (3F,W,Sp)

107. Art Theory and Analysis. Introduces art majors to University and Art Department requirements. Involves students with basic art theory and analytic processes. (3F)

120. Drawing. Introduction to the visual language of drawing, the graphic elements, the various drawing media, and the creative problems involved. Simple to complex subjects. (3F,W,Sp)

160. Three-dimensional Design. Study of form and space relationships using clay, plaster, wire, and wood. Emphasis on composition and expression of ideas. Prerequisites: Art 102, 120. (3F,W,Sp)

210. Presentation Techniques for Art Teachers. Development of presentation techniques for posters, bulletin boards, and teaching materials, including brush lettering, pen lettering, and layout. (3Sp)

217. Basic Ceramic Handbuilding. Introduction to techniques including pinch, coil, slab building, etc., as well as glazing. (3F,W)

218. Basic Ceramic Wheel Throwing. Emphasis on throwing and trimming techniques. (3F,W,Sp,Su)

222. Intermediate Drawing. A continuation of basic drawing emphasizing more complex drawing problems, techniques, and approaches. Prerequisite: Art 120. (3W,Sp)

226. Basic Painting. Introduction to the visual language of painting with an emphasis upon the expressive aspects of color. A variety of oil painting techniques will be explored. Prerequisites: Art 102, 120. (3F,W,Sp)

227. Watercolor. Exploration of formal, technical, and conceptual problems in water media. Prerequisites: Art 120, 226. (3F,Sp)

231. Basic Advertising Design. Introduction to principles and psychology of advertising. Thinking problems in media of newspaper, magazine, television, and posters. Grade is on concepts and thinking only. No art background needed. (3F)

235. Basic Illustration. Drawing, designing, and developing ideas for illustrations, using primarily black and white media. Drawing from the model and homework. (3F)

240. Basic Photography. Operation of camera and related equipment, exposure and developing of black and white film, elementary enlarging and finishing with emphasis on composition and photographic aesthetics. (3F,W,Sp,Su)

246. Basic Typography Design. Problems in typography, layout, and design for advertising and graphic design layouts. Learning type faces, printing methods, and ordering type. (3W)

252. Introductory Internship/Coop. Introductory level educational work experience in an internship/cooperative education position approved by the Department of Art. (1-6F,W,Sp,Su) ®

255. Basic Printmaking. An introduction to the theoretical and visual approach of printmaking. Studio work in the media of relief and intaglio. Prerequisites: Art 102, 120. (3F,W,Sp)

260. Basic Sculpture. The study of form and space relationships specific to the figure, utilizing clay. Direct modeling and modeling over an armature will be studied. Quarters taught may vary. (3F,Sp)

HU 275. Survey of Western Art. Prehistoric through Roman Empire. (3F)

HU 276. Survey of Western Art. Medieval through Renaissance. (3W)

HU 277. Survey of Western Art. Baroque through Modern. (3Sp)

310. Art Methods for Elementary Grades. Methods of teaching various art processes, crafts, art history, and art appreciation in the elementary schools. Required preparation for a grade school teacher. (3F,W,Sp)

311. Art Studio For Elementary School Teachers. Designed to develop art skills and concepts related to the core curriculum requirements in art in Utah's public schools. (3Sp)

312. Art Methods for Secondary Teachers. Methods of teaching art in the secondary schools. How to motivate various art processes, art history and appreciation. Curriculum development. Required for art education majors. (4F)

317. Intermediate Ceramic Handbuilding. This course follows Art 217, Basic Ceramic Handbuilding. Focus is on clay as a sculptural medium, applying traditional pottery technology to sculptural concerns. Prerequisites: Art 160 and 217. (3F,Sp) ®

318. Intermediate Ceramic Wheel Throwing. This class is a continuation of Art 218, Basic Ceramic Wheel Throwing. The student is expected to achieve a consistent level of ability; emphasis is on multiple production. Prerequisites: Art 217 and 218. (3W,Sp) ®

323. Anatomy for Artists. Analysis of the anatomical structure of the human figure through textbook studies, drawing, and three-dimensional clay studies from live models. Prerequisite to life drawing. Prerequisite: Art 120. (3F) ®

326. Intermediate Painting. Application of visual language to specific oil painting problems. Color theory, content, and technique emphasized. Prerequisites: Art 102, 120, and 226. (3W)

332. Commercial Art Seminar. A weekly seminar to discuss and view current art trends in advertising design, graphic design, and illustration. A professional guest artist will lecture and show his or her work once a month. Guest artist lab fee. (1F,W,Sp) ®

334. Intermediate Advertising Design. Learning the tools and application for advertising design layout and design. Learning the design of the printed page. Dye-marker indication. Prerequisite: Art 231. (3Sp) ®

335. Drawing for Illustration. To develop the habit of working in sketch books, doing drawings helpful in painting and usable as illustrations. Drawing from the model and homework. (3W) ®

337. Intermediate Illustration—Concept. Students develop ideas for illustrations and carry these ideas through the stages of roughs, comprehensives, and finished artwork. (3F) ®

338. Intermediate Illustration—Technique. Experience working with a variety of media on a variety of surfaces. Painting from the model and homework. (3W) ®

339. Intermediate Illustration—Storybook. Creation of illustrations appropriate for children's books. Experimentation encouraged. Some painting from the model and homework. (3Sp) ®

340. Intermediate Photography. A continuation of Art 240 to further experience the photographer in technical controls, aesthetics, and thoughts with an introduction to experimental laboratory/darkroom techniques. Prerequisite: Art 240. (3F,W)

344. Zone System. Based on photographic procedures developed by Ansel Adams. Contrast control in B&W film and paper extensively explored. Prerequisites: Art 240, 340, or equivalent experience. (3Sp)

***355. Printmaking: The Monotype.** The various methods of working in the medium of monotype will be studied, including printing and overpainting techniques. (3F) ®

***356. Color Printing.** Introduction to the use of color in printmaking. One or more of the following media will be used: intaglio, lithography, woodcut, or monotype. (3F) ®

357. Intaglio. Etching, soft-ground etching, and aquatint dealt with in depth. Work is primarily in black and white. (3Sp) ®

358. Basic Lithography. Introduction to the art and techniques of the medium. Work is in black and white on both litho stones and aluminum plates. (3W)

359. Relief Prints. Various techniques of relief printing: woodcut, linoleum cut, cardboard prints, and wood engraving. (3F) ®

****361. Sculpture Modeling I.** Develops an understanding of the structure of the human figure through clay modeling. Prerequisites: Art 160 and 260. (3F)

***362. Sculpture Carving I.** Introduction to basic methods of carving (reductive process): direct and indirect carving. Prerequisites: Art 160 and 260. (3F)

***363. Sculpture Construction I.** Develops construction skills (additive process) using various fastening devices. Includes development of skills with woodshop machinery. Prerequisites: Art 160 and 260. (3W)

***386. History of Illustration.** History of illustration in America from Howard Pyle to present; study of illustrators' lives, works, and lectures. (3Sp)

****387. History of Advertising.** Social trends, consumer needs, and technological advances will be studied to show their effects on the psychology of visual persuasion as used in advertising design. (3Sp)

388. History of Photography. The history of still photography as a medium rather than a technique. Covering a period from 1839 to the present. (3)

412. Teaching Instruction for Secondary Art Teachers. Methods of presenting art concepts and techniques for the secondary school teacher. (3W)

420. Drawing and Composition. Advanced drawing problems emphasizing various approaches to composition. Prerequisites: Art 120, 222. (3Sp) ®

421. Life Drawing. Drawing from the live model, studying the design and structure of the human figure, exploring various graphic interpretations. Prerequisites: Art 120, 323. (3W) ®

427. Painting: Composition and Color. Study of color with an emphasis on applied color interaction. Prerequisites: Art 102, 120, and 226. (3W) ®

430. Advertising Production. Learning production and layout of camera-ready art for advertising and graphic design. Ordering type, pasteup mechanicals, and overlays for camera-ready art. (3Sp) ®

431. Advertising Layout. Focuses on designing the printed page. Centers on learning typefaces and the art of designing with type. Prerequisites: Art 231 and 334. (3Sp) ®

436. Fashion Illustration. Creation of art appropriate for reproduction as fashion illustrations in newspapers, magazines, etc. Drawing from the model and homework. (3Sp) ®

443. Photo Lighting. Practical projects are assigned emphasizing studio lighting techniques. 4X5 camera required. Prerequisites: Art 240, 340, 344. (5F)

444. Photo Portraiture. Revealing personality and character. Study of the subject, desirable backgrounds, composition, and types of lighting. Prerequisites: Art 240, 340. (3Sp)

***445. Advanced Typography Design.** Finished lettering for magazine and newspaper advertisements, packaging, and symbols. Prerequisite: Art 246. (3W) ®

452. Advanced Internship/Coop. Internship/cooperative education work experience in Art. For those students needing increased complexity and a more professional level of experience in the workplace. (1-15F,W,Sp,Su) ®

****461. Sculpture Modeling II.** Higher level skill development in modeling the human figure. Combines objective accuracy, abstraction, and distortion as valid forms of expression. Prerequisites: Art 160, 260, 361. (3W)

***462. Sculpture Carving II.** Advanced level carving. Introduction to pneumatic tools and finishing techniques. Prerequisites: Art 160, 260, 362. (3W)

***463. Sculpture Construction II.** Higher level skills in additive process sculpture. Includes site specific work and installation. Prerequisites: Art 160, 260, 363. (3Sp)

****464. Sculpture Mold-making.** Introduction to replacement process through the use of molds and plaster casting. Prerequisites: Art 160, 260, 361. (3W)

474 (d674)[1]. Greek and Roman Art. Origin and development of the art and architecture of Crete, Mycenae, Greece, and the Roman world. (3Sp)

475 (d675). Medieval Art. Development of art and architecture in the west from the end of the Roman Empire to the Gothic Period. Prerequisite: Art 276 or consent of instructor. (3)

478 (d678). Renaissance Art. Development of European art and architecture from the thirteenth to the sixteenth centuries. (3)

481 (d681). Baroque and Rococo Art. Development of art and architecture in Europe from the sixteenth to the eighteenth centuries. (3)

482 (d682). Nineteenth Century Art. Painting and sculpture from Neoclassicism to Symbolism. Prerequisite: Art 277 or consent of instructor. (3F)

483 (d683). Twentieth Century Art. History of painting, sculpture, and architecture from the post-impressionists to the present. (3W)

484 (d684). American Art. History of painting, sculpture, and architecture in America from colonial times to the present. (3Sp)

514. Student Teaching at University Level. Teaching techniques and procedures for university level. Prerequisite: approval of major professor. (1-9F,W,Sp) ®

515. Ceramic Studio. Selected topics in contemporary ceramic techniques, including glaze formulation, firing, etc. Prerequisites: Art 217, 218, 317, 318. (3-9F,W,Sp,Su) ®

521. Advanced Life Drawing. Drawing from the model with concern for the human figure but with greater emphasis on interpretative approaches and composition. Prerequisites: Art 323, 421. (3Sp) ®

522. Drawing Studio. Advanced individual drawing projects dealing with a central theme and a specific approach. Prerequisite: approval of major professor. (1-9F,W,Sp,Su) ®

526. Art Studio. Advanced problems in emphasis, medium, and idiom of student's choice. Student plans project and executes it through individual initiative and scheduled consultation with the instructor. Prerequisite: consent of instructor. (1-9F,W,Sp) ®

527. Painting Studio. Designed to develop creative problem solving through the process of research and experimentation. Various painting ideas and painting media may be explored. Prerequisites: Art 120, 226; consent of instructor. (1-9F,W,Sp,Su) ®

528. Advanced Painting. Special problems in painting, focusing on the conceptual aspects of painting and the development of each student's individual abilities. Prerequisites: Art 226, 326, 427. (3Sp) ®

529. Figure Painting. Painting from the live model with emphasis on solving problems of the planar structure of the human form. Prerequisites: Art 326 and 421. (3F,Sp) ®

531. Advertising Design Studio. Theory of designing the complete advertising campaign. Training in producing professional advertising for employment in this field. Prerequisites: Art 231, 334. (1-9F,W,Sp) ®

535. Advanced Illustration. Illustration on a professional level. Experimentation with in-class work encouraged. Most guest artist assignments given in this class. Prerequisite: Art 335. (1-9F,W,Sp) ®

537. Illustration Studio. Illustrations of a specific nature, determined by the student and instructor, are produced. Concurrent enrollment in Art 535, to work from the model, is required. Prerequisite: approval of major professor. (1-9F,W,Sp) ®

540. Photography Studio. Student designs own project in conjunction with instructor, then works independently. Especially important for advanced students who have decided on a specialty area. Prerequisites: Art 240, 340 and approval of major professor. (1-9F,W,Sp) ®

541. Photography Illustration. Great emphasis placed on the thinking, planning, and interpreting of an idea photographically. Applied or commercial aspects of photographs produced for advertisements and editorial use. Professional portfolio pieces produced for employment in the field. Students required to have 4x5 camera. Prerequisites: Art 240, 340, 344, 443. (5W,Sp) ®

Basic Photo Illustration. (5W)

Advanced Photo Illustration. (5Sp)

542. Color Printing. *Fall*—Color theory and production of correctly color balanced print. *Winter*—Manipulative capabilities and expressive potential of color printing materials. *Spring*—All areas of color slide production, emphasizing both straight and manipulated images. Prerequisites: Art 240, 340. (3F,W,Sp) ®

Basic Color Printing. (3F)

Advanced Color Printing. (3W)

Color Positive—slides. (3Sp)

545. Advanced Design—Corporate ID. Trademark design with applications to stationery and business forms. Portfolio perfect. Prerequisite: Art 246. (3F) ®

546. Advanced Design—Editorial. Layout and design of consecutive pages in magazines and annual reports. Portfolio perfect. Prerequisite: Art 246. (3W) ®

547. Advanced Design—Poster. Layout and design of posters integrating hand-lettering, typography, illustration, and photography. Portfolio perfect. Prerequisite: Art 246. (3Sp) ®

548. Advanced Design—Package. Design of commercial packages. Finished artwork in lettering, type, graphics, and photography for portfolio perfect pieces. Prerequisite: Art 246. (3Sp) ®

549. Graphic Design Studio. Advanced class to prepare the design major for employment in the graphic design field. Finished portfolios of package, trademarks, and editorial design worked on. Prerequisite: Art 246. (1-9Sp) ®

559. Printmaking Studio. Individual production of prints using all printmaking media and techniques. Emphasis on woodcuts in fall; lithography in winter; etching in spring. Prerequisite: Art 255. (1-9F,W,Sp) ®

560. Sculpture Studio. Advanced problems dealing with figurative and nonfigurative expression. Emphasis on clay modeling, fall; plaster and wax modeling, winter; wood and stone carving, spring. Prerequisites: Art 160, 260, 361, 362, 363, 461, 462, 463. (1-9F,W,Sp) ®

561. Sculpture Seminar. Issues in twentieth century sculpture. Involves research, writing, and production. Prerequisite: one 400-level sculpture course. (3Sp)

589. Art History Seminar and Special Problems. Prerequisite: consent of instructor. (1-6) ®

Graduate[2]

615. Graduate Ceramic Studio. (3-9F,W,Sp,Su) ®

620. Graduate Drawing Studio. (1-9F,W,Sp,Su) ®

625. Graduate Painting Studio. (1-9F,W,Sp,Su) ®

630. Graduate Advertising Design Studio. (1-9F,W,Sp) ®

635. Graduate Illustration Studio. (1-9F,W,Sp) ®

640. Graduate Photography Studio. (1-9F,W,Sp,Su) ®

645. Graduate Graphic Design Studio. (1-9F,W,Sp) ®

652. Graduate Internship/Coop. (1-15F,W,Sp,Su) ®

655. Graduate Printmaking Studio. (1-9F,W,Sp,Su) ®

660. Graduate Sculpture Studio. (1-9F,W,Sp,Su) ®

674 (d474). Greek and Roman Art. (3Sp)

675 (d475). Medieval Art. (3)

678 (d478). Renaissance Art. (3)

680. Seminar. (1-9F,W,Sp) ®

681 (d481). Baroque and Rococo Art. (3)

682 (d482). Nineteenth Century Art. (3F)

683 (d483). Twentieth Century Art. (3W)

684 (d484). American Art. (3Sp)

697. Research and Thesis. (1-9F,W,Sp) ®

699. Continuing Graduate Advisement. (1-3F,W,Sp) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

*Taught 1996-97.

**Taught 1997-98.

Department of
Biological and Irrigation Engineering
College of Engineering

Head: Professor Wynn R. Walker
Office in Engineering Class 216, 797-2785

Professors Conly L. Hansen, Robert W. Hill, Richard C. Peralta, Linda S. Powers, Gaylord V. Skogerboe; **Research Professor** Gosh Santibrata; **Professors Emeritus** Bertis L. Embry, Richard E. Griffin, George H. Hargreaves, Jack Keller, Howard B. Peterson, Glen E. Stringham, Lyman S. Willardson; **Associate Professors** Richard G. Allen, Christopher M. Neale, Edwin C. Olsen III, Stephen E. Poe; **Assistant Professors** Kathryn L. "Kitt" Farrell-Poe, Joseph Irudayaraj, Gary P. Merkley; **Research Assistant Professor** Robert B. Sinclair; **Research Assistant Professor Emeritus** R. Kern Stutler; **Research Engineer** Blair L. Stringam

Degrees offered: Bachelor of Science (BS), Master of Science (MS), and Doctor of Philosophy (PhD) in Biological and Agricultural Engineering; MS and PhD in Irrigation Engineering

Objectives

Biological Engineering applies engineering principles and the science of biology to the solution of bioresource problems. Agriculture, from seed to supermarket shelf, is the largest bioresource industry, but the biological revolution is making possible a whole new realm of products, procedures, and services. Genetically-manipulated organisms, new drugs, biomaterials, animal growth hormones, plants with specially designed genetic potentials, and manufactured foods are the beginning of a rapidly growing list. To bring all these and other products into practice, Biological Engineers with a sound base in the biological sciences are needed. The accredited Biological Engineering program at USU is designed to help students appreciate the realities of living biological materials, understand the biological literature, and be able to communicate with biological scientists.

The Biological Engineer first learns to integrate an understanding of biological science with conventional studies in mathematics, chemistry, and physics. These skills, coupled with a broad exposure to humanities and social sciences, are the basic

preparation for pursuing an engineering career. From here, the program focuses on engineering topics, which will develop practical problem-solving abilities; expand a sensitivity to the economic, social, and legal dimensions of technical problems; provide an understanding of ethics and professional responsibility; and stimulate a desire for life-long learning.

The engineering topics a biological engineer will master can be divided into general concepts and specialized skills. General concepts include the properties of biological materials, electronics and instrumentation, computer use and programming, engineering mechanics and thermodynamics, computer-aided drafting, bio-environmental transport phenomena, hydraulics, and fluid mechanics. More than half of these courses include open-ended design problems to integrate basic science into engineering design and problem-solving.

Specialized skills evolve from a student's selection of one of two fundamental areas of biological engineering: (1) Soil and Water Resource Systems Engineering; and (2) Food and Bioprocess Systems Engineering. These areas of study are tailored for each student with 33 quarter credits of technical electives and one-on-one academic advisement with a member of the faculty. Design is a major theme of the student's specialization, with most courses including open-ended design problems. The entire design experience is brought together in a capstone design course.

In Soil and Water Resource Systems Engineering, students focus on problems of irrigation, drainage, remote sensing, groundwater development and protection, water quality, plant water requirements and yield response, and the specific challenges in designing and managing these systems. Food and Bioprocess Systems Engineering deals with product formulation, design, operation, scaleup, and improvement of manufacturing processes to yield bioproducts at high volume and acceptable costs. Treatment, disposal, and biodegradation of biowastes; processes for obtaining value-added products from renewable resources; and engineering inputs to biotechnology (Protein Engineering) and biotechnology-related industries are also studied.

The Bachelor of Science program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET).

Admission and Graduation Requirements

The student who is majoring in or planning to major in Biological and Agricultural Engineering needs to be aware of the College of Engineering requirements concerning admission to the college, preengineering, admission to the professional engineering school, general education, and other academic requirements. Additional information concerning these items is given in the College of Engineering write-up on pages 45-49. It is the responsibility of the student to be aware of these rules and regulations.

Bachelor of Science. The four-year program suggested below will satisfy the requirements for a BS degree in Biological and Agricultural Engineering. The academic work, particularly in the junior and senior years, is supplemented by hands-on laboratories which are required as part of the coursework. Modification in the program to meet special needs and priorities of a student may be obtained with the approval of the department head and adviser.

Biological and Agricultural Engineering Curriculum

Freshman Year: Engr 187; BIE 188; Biol 125, 126; Chem 121, 122, 123, 124, 160; Engl 101; Math 220, 221, 222; Phyx 221.

Sophomore Year: BIE 233, 287; CS 150; Econ 200; ECE 270; Engl 201; Engr 200, 202, 204; ITE 227; Math 320, 321, 322; Micb 111, 112; 3 credits of HU/SS.

Junior Year: BIE 320, 367, 470, 487; CEE 350, 351; Engl 305; Engr 330; 7 credits of HU/SS; 16 credits of technical electives.

Senior Year: BIE 488, 489; Biol 576; CEE 420, 425; 13 credits of HU/SS; 17 credits of technical electives.

Acceptable Technical Electives in two specializations (33 credit hours total):

Soil and Water Resource Systems Engineering. BIE 518, 525, 543, 545, 546, 547, 548, 550, 560, 580, 581, 582, 583, 584; CEE 224, 343, 364, 365, 543, 585; Math 461; Soil 358, 359, 565, 566; WS 545, 549.

Food and Bioprocess Systems Engineering. BIE 316, 504, 516, 524, 526, 580, 581, 582, 583, 584; CEE 365, 568, 585; Chem 231, 232, 233, 234, 235, 370, 371; ITE 352; MAE 514; Math 461; NFS 511, 544, 550, 556, 557; Phyl 130. Additional courses are planned in biomaterials packaging, biowaste management and utilization, and unit processes in bioprocess engineering. Students should consult departmental advisers for availability and scheduling.

Students receiving credit from the College Level Examination Program (CLEP) or from Advanced Placement (AP) may complete a BS degree program in less than four years.

This department cooperates with the Department of Plants, Soils, and Biometeorology to offer a BS degree program with a major in Environmental Soil/Water Science. The course program includes some of the applied irrigation engineering courses, as well as basic courses in mathematics, science, and soils. A complete outline of the program in Environmental Soil/Water Science can be found under the Plants, Soils, and Biometeorology Department.

Graduate Study

The Department of Biological and Irrigation Engineering offers two graduate degrees: Master of Science and Doctor of Philosophy. See the *Graduate Catalog* for prerequisites and further information concerning procedures and course descriptions.

Biological and Irrigation Engineering Courses

188. Engineering Orientation and Computer Applications. Orients students to the profession of Biological and Agricultural Engineering (BAE), the BAE faculty, professional societies, and engineering careers. Laboratory activities emphasize

writing, word processing, and spreadsheet applications. Prerequisites: Math 106 and keyboarding at 25 WPM. (1W)

233. Engineering Properties of Biological Materials. Relationships between composition, structure, and properties of biological materials. Definition, measurement, and use of mechanical, thermal, electromagnetic chemical, and biological properties in computation and design. Prerequisite: Math 222 or permission of instructor. (4Sp)

287. Sophomore Seminar. Orients students to fundamentals of engineering. Emphasis given to introducing analog electronics, biomaterial properties, and instrumentation. (1F)

316. Methods in Biotechnology: Basic Principles. A laboratory intensive course designed to provide a foundation in basic methods in biotechnology, including cell growth, and isolation and characterization of protein and DNA. (3F,Sp)

320. Introduction to Biochemical Engineering. Basic physico-chemical principles underlying design of biochemical structure and function. Emphasis on interface between biochemistry and technology. Prerequisites: Math 221 or equivalent; Chem 123 or permission of instructor. (4W)

367. Transport Phenomena in Bio-Environmental Systems. A core course in both biological and environmental engineering. Students develop a detailed understanding of the principles, concepts, modes, and methods of calculating heat and mass transfer. Emphasis given to contaminants and nutrient flux, along with their state transformations in order for the biological or environmental engineer to evaluate options for production, clean-up, and control of bio-environmental systems. Prerequisites: Engr 330; CEE 350, 351. (3Sp)

425. Cooperative Practice. Planned work experience in industry. Detailed program must be approved prior to registration. Written report required. (2-5F,W,Sp,Su) ®

470. Instrumentation for Biological Systems. Fundamentals of measurement systems used in agricultural, biological, and environmental applications with particular emphasis on sensors, transducers and signal conditioning circuits, data acquisition systems, and elementary controls. Prerequisite: admission to professional program. Prerequisites: BIE 287; ECE 270 or permission of instructor. (4F)

487. Capstone Design Experience I. Students conceive, plan, and propose a senior design project. Prerequisites: BIE 233, 367, 470; Engl 305. (1Sp)

488. Capstone Design Experience II. Execution and completion of a comprehensive senior design project. Prerequisite: BIE 487. (4F)

489. Capstone Design Experience III. Preparation and presentation of the senior project. The presentation will involve a professional standard report and an evaluation and critique by Biological Engineering students and faculty. Prerequisite: BIE 488. (2W)

493. Special Studies. Independent or group study of biological and irrigation engineering subjects not covered in regular course offerings. (1-6F,W,Sp,Su) ®

504 (d604).[1] Food and Bioprocess Engineering. Standardization and compounding of biomaterials and food products; preservation processing using heat, refrigeration, concentration, and dehydration. Basic unit operations in the bioprocessing industry. Quality control of raw and finished bio-products. (4Sp)

516. Methods in Biotechnology: Cell Culture. Laboratory-intensive course in basic and applied methods of culturing cells (mammalian, insect, plant) and methods of fusing and transforming cells. Prerequisites: Biol 125 or ADVS 316 or equivalent, or permission of instructor. (3W)

518 (d618). Engineering Aspects of Soil and Water Conservation. Erosion control structures, terraces, and outlets, grassed waterways, soil saving dams. Tillage and farming methods including strip cropping, contouring, and land forming. Three lectures, one lab. Prerequisite: Senior-level standing. (4Sp)

524. Methods in Biotechnology: Protein Purification Techniques. Laboratory-oriented course designed to provide basic knowledge in protein purification, analysis, and its scale up. Prerequisites: Chem 370 or ADVS 316, or permission of instructor. (3Sp)

525 (d625). Principles of Remote Sensing and Applications in Agriculture and Hydrology. Techniques for field ground-based measurements of reflected and emitted radiation as well as ancillary data collection to support airborne and satellite remote sensing studies in agriculture and hydrology. Recommended: Introductory calculus and physics. (4Sp)

526. Methods in Biotechnology: Molecular Cloning. Laboratory-oriented course in molecular cloning techniques such as DNA cloning, genetic probes, PCR, DNA sequencing. Prerequisites: Chem 370 or Biol 319 and Micb 301 or equivalent. ADVS 316, or permission of instructor. (3F)

543 (d603). Principles of Irrigation Engineering. Soil-water-plant relationships; evapotranspiration and water requirements; effective water use; irrigation scheduling; infiltration; irrigation systems planning. Prerequisites: Engr 103 or CS 150 or equivalent; for BAE students: also CEE 343, CEE 350 or equivalent previously or concurrently. (4F)

545 (d605). Drainage Engineering for Agricultural, Urban, and Wetland Environments. Introduction to principles and practices of drainage. Engineering investigation and design of open drains and wells. Prerequisite: CEE 350. Three lectures, one lab. (4Sp)

546 (d606). Water Supply Development and Conveyance Systems. Development of surface and ground water supplies. Capacity requirements and outlet conduits for storage reservoirs. Design of wells and pump selection. Design of canals, pipelines, flumes, and inverted siphons. Water measurement. Prerequisite: CEE 343 or 350. (3W)

547 (d607). Sprinkle and Trickle Irrigation. Sprinkle and trickle irrigation system demand, system selection and configuration, emitter and sprinkler characteristics and sizing, uniformity and efficiency, pipe network layout and sizing, and system operation, management, and maintenance. Prerequisites: BIE 543, CEE 350 or 351. (5W)

548 (d608). Surface Irrigation Design. Design and evaluation of surface irrigation systems. Field measurements for evaluating and improving uniformity and efficiency. Simulation of surface systems. Land leveling computation and equipment. Prerequisite: BIE 543/603. (4Sp)

550 (d610). Irrigation System Analysis. Field lab with formal reports covering water measurement; soil-water management, land leveling, and evaluation of border, furrow, sprinkle, and trickle systems. One recitation, one double lab. Prerequisites: BIE 543/603, 547/607, 548/608, concurrent registration, or permission of instructor. (3Sp)

560 (d620). Water Management. Organizing, administering, and financing irrigation and drainage projects. Operation and maintenance of irrigation distribution systems. Simulation of command area water demands. Alternative delivery scheduling. Prerequisite: BIE 543/603. (4W)

581. Biochemical Engineering. Fundamentals of bioreactor design and bioengineering. Emphasis is on mathematical models of microbial and enzymatic processes in environmental and industrial biotechnology. Prerequisites: CEE 365, 580; and Micb 111 and 112, or Biol 125. (3W)

582. Biomass Processing. Introduction to the use of renewable resources for energy production and waste management. Prerequisites: Micb 111 or 112 or Biol 125; BIE/CEE 367. (3Sp)

583. Land Treatment of Wastes. Engineering management of the upper part of the vadose zone for treatment and ultimate disposal of nonhazardous wastes, including industrial, agricultural, and domestic wastes. Prerequisites: CEE 364 and 543. (3W)

584. Agricultural Waste Management Systems. Evaluation and design of engineering treatment systems for the management of agricultural wastes, utilization of aerobic and anaerobic systems, ponds and land application facilities for agricultural waste management and control. Prerequisites: CEE 350, 351, and BIE/CEE 367. (3Sp)

Graduate[2]

603 (d543). Principles of Irrigation Engineering. (4F)

604 (d504). Food and Bioprocess Engineering. (4Sp)

605 (d545). Drainage Engineering for Agricultural, Urban, and Wetland Environments. (4Sp)

606 (d546). Water Supply Development and Conveyance Systems. (3W)

607 (d547). Sprinkle and Trickle Irrigation. (5W)

608 (d548). Surface Irrigation Design. (4Sp)

610 (d550). Irrigation System Analysis. (3Sp)

618 (d518). Engineering Aspects of Soil and Water Conservation. (4Sp)

620 (d560). Water Management. (4W)

625 (d525). Principles of Remote Sensing and Applications in Agriculture and Hydrology. (4Sp)

631. Field Irrigation Management. (3F)

657. Flow Measurement and Control. (4F)

671. Bioprocesses in Engineered and Environmental Systems. (4F)

680. Seminar. (1-2F,W,Sp) ®

693. Special Problems in Agricultural Engineering. (1-5F,W,Sp,Su) ®

696. Supervised Teaching in Irrigation. (2-3F,W,Sp)

697. Thesis Research. (1-9F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

****735. Optimal Groundwater and Conjunctive Water Management I.** (3Sp)

****736. Optimal Groundwater and Conjunctive Water Management II.** (3Sp)

745. Drainage Investigation and Design. (3W)

***760. Irrigation System Operations.** (4Sp)

780. Seminar. (1-2F,W,Sp) ®

797. Dissertation Research. (1-15F,W,Sp,Su) ®

799. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

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[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

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*Taught 1996-97.

**Taught 1997-98.

Department of
Biology

College of Science

Head: Professor Edmund D. Brodie, Jr.
Office in Biology-Natural Resources 127, 797-2485

Associate Head: Associate Professor David B. Drown
Office in Biology-Natural Resources 101, 797-2773

Professors Anne J. Anderson, William A. Brindley, LeGrande C. Ellis, James A. Gessaman, Ting H. Hsiao, Joseph K.-K. Li, James A. MacMahon, Keith A. Mott, Ivan G. Palmblad, William J. Popendorf, Jon Y. Takemoto, Sherman V. Thomson, Reed P. Warren, Nabil N. Youssef; **Adjunct Professors** Mark C. Healey, W. David Liddell, Rex S. Spendlove; **Professors Emeriti** Thomas L. Bahler, George E. Bohart, James T. Bowman, Jr., William S. Boyle, Donald W. Davis, Keith L. Dixon, B. Austin Haws, Gene W. Miller, Frederick J. Post, Reed S. Roberts, Raymond T. Sanders, Richard J. Shaw, John R. Simmons, John J. Skujins, Hugh P. Stanley; **Associate Professors** Diane G. Alston, Mary E. Barkworth, Edward W. (Ted) Evans, James W. Haefner, Raymond I. Lynn, Frank J. Messina, Richard J. Mueller, Gregory J. Podgorski, Peter C. Ruben, Kimberly A. Sullivan, Dennis L. Welker, George W. Welkie; **Research Associate Professors** Bill B. Barnett, Darwin L. Sorensen; **Adjunct Associate Professors** John C. Bailey, Noelle E. Cockett, Michael J. Jenkins, Jay B. Karren, J. Dennis O'dell, Vincent J. Tepedino, Anthony R. Torres, Richard R.-C. Wang; **Associate Professors Emeriti** Merrill H. Gunnell, Wilford J. Hanson; **Assistant Professors** Daryll B. DeWald, Bradley R. Kropp, John M. Stark, Dana K. Vaughan, Paul G. Wolf; **Research Assistant Professor** Joanne E. Hughes; **Clinical Assistant Professor** Daniel A. Boston; **Adjunct Assistant Professors** W. Sue Fairbanks, Philip F. Torchio; **Principal Lecturer** David M. "Andy" Anderson; **Lecturer** Alice M. Lindahl

Degrees offered: Bachelor of Arts (BA), Bachelor of Science (BS), Master of Science (MS), and Doctor of Philosophy (PhD) in Biology; BS in Applied Biology, BS in Public Health, MS and PhD in Ecology (Biology); MS and PhD in Biology (Molecular Biology); MS and PhD degrees in Toxicology, available through the Interdepartmental Toxicology Program

Objectives

Biology. The Department of Biology offers programs leading to a Bachelor of Science or Bachelor of Arts degree. Students majoring in Biology will complete courses which provide an in-depth understanding of biological principles. These include ecology, genetics, cell biology, microbiology, and physiology. Upper-division courses in developmental and evolutionary biology provide biology majors with an integrated learning experience. Additional coursework is designed to develop analytical and applicable skills in such areas as mathematics, chemistry, and physics. Biology degree programs serve as a foundation for graduate work beyond the bachelor's level, which is strongly encouraged for those who demonstrate an aptitude as undergraduates. Biology majors can add a minor area of study, such as business, chemistry, or secondary education, to enhance their employment opportunities.

Applied Biology. The Bachelor of Science degree in Applied Biology is directed toward students requiring specialized biological training to prepare them for employment at the bachelor's level. The Applied Biology degree is offered with emphases in microbial biotechnology, environmental biology, and entomology.

Premedical and Predental Programs. The Biology Department supervises premedical and predental training. These programs satisfy entrance requirements for most medical and dental schools in the United States and Canada and are recognized for the high quality preprofessional preparation they provide. After four years, the student receives a BS degree in Biology or another major. **Adviser:** Susan Nelson, BNR 101.

Public Health. The Department of Biology offers preprofessional training in public health. Individuals completing the BS degree have employment opportunities in such areas as environmental health, industrial hygiene, laboratory microbiology, health education, administration, nursing, nutrition, mental health, and social work. **Adviser:** David Drown, BNR 101.

The Department of Biology department head, the director of undergraduate studies, and advisers are available to provide all undergraduate majors with additional information regarding specific programs and career opportunities.

General College of Science Requirements

Orientation Requirement. All students graduating from the College of Science are required to take the college orientation course: Sci 150, Science Orientation.

Written Communications Requirement. In addition to the University's written communication requirement, the college requires a junior level writing class. This requirement may be filled by completing either English 301 or 305.

Bachelor of Science Core Requirements. Students working toward the Bachelor of Science degree in any major within the College of Science must complete the following:

A. Math 220 and 221.

B. Either CS 160 or Stat 201.

C. One of the following sequences: (1) Biol 125 and either Biol 126 or Biol 127; (2) Chem 121, 122, and 124; (3) Geol 111 and 200; (4) Phyx 221 and 222.

Majors in Biology, Chemistry and Biochemistry, Geology, and Physics **cannot** satisfy requirement *C* by taking a sequence in their own discipline. Higher level courses than the ones listed in the three categories above may be substituted in some instances. Approval for any substitutions must be obtained in advance.

Note: The above Bachelor of Science requirements are **not** in effect for the Bachelor of Arts degree.

Department of Biology Requirements

Departmental Admission Requirements. Admission requirements for the Department of Biology are the same as those described for the University on pages 8-11. Students in good standing may apply for admission to the Biology Department.

In order to graduate, a candidate for any bachelor's degree offered in the Department of Biology must accumulate a grade point average of 2.25 in all courses specified as requirements in that major. All required courses in mathematics, chemistry, physics, and English (at the 200 and 300 level) are included. The Pass-Fail option is not acceptable for any course required for the BS degree in any biology program, but *D* grades are permitted within the restrictions of the 2.25 GPA. The same GPA requirements apply to the biology minor.

BS Degree in Biology. The student is required to have a total of 60 credits in biology, including Biol 125, 126, 127, 319, 386, 387, 521, 523, 525; Micb 301; and one upper-division physiology course selected from Bot 440, Ent 532, or Micb 401; or Phyl 505 and one of Phyl 404, 501, or 502. Only biology courses numbered 400 and above may be used for biology electives applied to the 60 credit total. In addition, BS students must complete Math 220 and 221; Chem 121, 122-124, 123-160, 231-234, 232-235, 370-371; and either Phyx 111, 112, and 113 or Phyx 221, 222, and 223.

BA Degree in Biology. The student must complete the requirements for the BS in Biology (above) plus two years of a foreign language. (See page 18 of this catalog.)

Students majoring in biology may also emphasize an area of interest in a recognized discipline within the department. The courses required for a program in a specific study area are recommended by faculty in that discipline. Students should take all courses required by the BS/BA degree in addition to courses in the area of emphasis.

BS Degree in Applied Biology. Students interested in this degree must make formal application to the department head. All programs are required to be finalized and approved before the senior year by the department head. Students interested in entomology, microbial biotechnology, environmental biology, or other approved programs are required to have a total of 46 credits in biology, including Biol 125, 126, 127, 319, and 386. It is necessary to have a substantial area of specialization in some applied phase of biology. Applied Biology students are also required to complete 15-30 credits of Chemistry including organic chemistry, and either Phyx 120 or Phyx 111, 112, and 113, as well as previously listed required College of Science courses.

BS Degree in Public Health. A four-year program leading to the Bachelor of Science in Public Health is offered by the Department of Biology with options in the following areas: environmental health, industrial hygiene, and public health education. Individuals completing the environmental health option are qualified to take the Registered Sanitarian's Examination. Those completing the industrial hygiene option qualify to sit for examination by the American Board of Industrial Hygiene following one year of professional experience. Required core courses include: Biol 125, 126, 127, 319; PubH 349, 510, 512, 530. Additional biology and public health courses, as well as chemistry and physics courses appropriate to each option, are also required.

Field Trips. Many biology courses require field trips. Those enrolled are expected to dress appropriately for the conditions and observe any safety precautions issued by instructors. Many courses require modest laboratory fees.

Course Planning and Advising. Students with majors in the Department of Biology should consult with their advisers regularly as they plan their course of study. Students have the responsibility to keep themselves aware of major requirements and course prerequisites. General requirements, specific course offerings, and the quarters that courses are taught may change. Mathematics is an important and required skill to enhance one's success in the sciences. Proper course level placement in mathematics at the beginning of the degree program is essential. Students should consult with an adviser to determine the appropriate level to begin their mathematics studies for meeting requirements and successful completion of their major. For detailed information, obtain an official Major Requirement Sheet from a department adviser.

Biology Minor. Students desiring a minor in Biology must complete Biol 125, 126, 127, and a minimum of 18 credits in upper-division Department of Biology courses. Specific questions concerning courses to take in the minor should be directed to the regular major adviser, as well as to one of the advisers in the Department of Biology. Contact the Department of Biology Student Assistance Office, BNR 101, or the Undergraduate Director, BNR 143, for assistance.

Biology/Plant Biology Minor. There is also a special minor offered in Biology/Plant Biology. Students desiring a minor in Biology/Plant Biology must complete Biol 125, 126, and three of the following four classes: Bot 420, 440, 510, 560, and additional upper-division biology electives to bring the total to 33 credit hours. Contact the Department of Biology Student Assistance Office, or the Director of Undergraduate Studies, BNR 101, for assistance.

Composite Teaching Major or Biology Teaching Minor. A composite teaching major in biological science or a teaching minor in biology is available through the Department of Biology. Students seeking this degree should see the detailed requirement sheet available for this major.

An application for admission to teacher education should ordinarily be completed before the junior year (see College of Education for requirements). Approval is a prerequisite to teacher certification candidacy and to enrollment in education and psychology courses.

Honors. There is also an Honors Plan for students desiring a BS degree "with Honors" in Biology. For details, students should contact their academic adviser or Richard Mueller, BNR 243.

Undergraduate Research—Bachelor's Thesis in Biology

Students may do undergraduate research work under the supervision of selected faculty members. To participate and receive academic credit, a student must enroll in Biol 480, Undergraduate Research, for up to 6 credits taken during one or more quarters. To complete the research project and write a thesis, a student must be enrolled in Biol 490, Bachelor's Thesis, for 3 credits. Thus, a total of 9 credits could be applied toward the 60 credits of upper-division courses required by the University for the BS or BA degree. Contact the Director of Undergraduate Studies, BNR 143, for assistance.

A thesis supervisory committee must be organized, consisting of an approved biology faculty member and at least one other faculty member. The supervisory committee is subject to the approval of the department head.

Graduate Study

For those who have demonstrated strong academic capability as well as research interests, the Department of Biology offers the *Master of Science Degree in Biology* or the *Doctor of Philosophy Degree in Biology*. The department's areas of specialization are animal behavior and neurobiology, developmental biology, ecology, entomology, microbiology, molecular biology, physiology (animal, microbial, plant), plant pathology, plant systematics, toxicology, and zoology. Interdepartmental curricula or centers in ecology and in toxicology also offer *Master of Science* or *Doctor of Philosophy degrees* in those disciplines with participation of the Department of Biology.

Undergraduate majors in Biology with especially strong backgrounds and interest in research may apply for study of the Master of Science degree as transitional students. Acceptance as a transitional student allows undergraduates with advanced standing to integrate up to 18 credits of graduate work into the final quarters of their *Bachelor of Science* study. Acceptance into this program, as into all graduate programs in Biology, is closely regulated. Formal application is required before beginning any graduate program.

Herbarium. Graduate study in plant taxonomy offered in the Department of Biology utilizes the extensive facilities of the Intermountain Herbarium. Most plant species that grow in Utah and the intermountain region are represented in the herbarium.

Electron Microscopy Facility. A state of the art teaching and research electron microscope laboratory is located in the VSB Building. This facility has four electron microscopes, two for electron transmission microscopy, including a Zeiss CEM902 with electron energy loss elemental analysis capability. There are two scanning electron microscopes, including a Hitachi S4000 field emission SEM with analytical elemental analysis capability. In addition, a complete electron microscopy preparation laboratory is available.

Insect Collection. Comprising over a million specimens, the insect collection is available to scientists and graduate students involved in taxonomic research and to those requiring identification of insects in various research projects. The collection primarily covers the intermountain region, but it also contains species from nearly all areas of the world. The bee collection is especially outstanding.

Vertebrate Collection. Several thousand specimens of terrestrial vertebrates are available for systematic and distributional studies.

Biology Courses

LS 100. Principles of Biology. An introduction to the fundamental principles of biology as they relate to man and his environment. This course is offered through Independent Study only. (4F,W,Sp,Su) ©

LS 101. Biology and the Citizen. Principles of biology as they impact the daily life and environment of the individual. Five lectures highly illustrated with visuals and demonstrations. (5F,W,Sp,Su)

LS 102. Biology and the Citizen Laboratory. A laboratory course made up of eight experiments designed to increase skill in measurement, independent observation, and understanding of basic biology. Biol 101 must be taken as a prerequisite or concurrently. (1W,Sp)

LS 105, LS 106. Discovering Nature. Exploration of conspicuous physical and biological features or phenomena in our surroundings. One lecture-demonstration, one field trip or practical exercise per week. (2F,Su) (2Sp,Su)

LS 125. General Biology I. Introduction to cell structure and function; gene action; genetics; origin of living systems; and survey of viruses, bacteria, and protists. Four lectures, one lab. (5F,W,Su)

126. General Biology II. Principles of evolution and ecology; structure, function, and diversity of fungi and plants; and introduction to human use of plants. Prerequisite: Biol 125. Four lectures, one lab. (5W)

127. General Biology III. Diversity, structure, reproduction, development, and homeostasis of animals. Prerequisite: Biol 126. Four lectures, one lab. (5Sp)

IO 205. Plants and Civilization. Origin, evolution, and human dependency upon cultivated plants. Emphasis is given to crop plants, drugs, and narcotics in relation to human history. Anthropology, biology, and early human history are recommended. (3W)

225. Introductory Internship/Co-op. An introductory level educational work experience in biology in an internship/cooperative education position approved by the department. (1-6F,W,Sp,Su) ®

LS 257. Evolution. A general consideration of principles of biological evolution as they apply to plants, animals, and humans. (3W) ©

IO 308. Evolution and Environmental Issues. Evolutionary mechanisms and ecological principles with emphasis on current socio/environmental problems. Prerequisite: Biol 101 or 125. (4Sp)

IO 310. Bioethics. Discussion of current controversial issues in medicine, animal rights, aesthetics, and conservation (biodiversity, energy, endangered species, overpopulation, and pollution). (3F)

319. Principles of Genetics. An introduction to the classical and molecular aspects of modern genetics. Prerequisites: Biol 125 and Math 105. (5F,W,Sp)

320. Genetics Laboratory. Laboratory exercises to study the principles of molecular, transmission, and population genetics. Computer simulation exercises used as study aids. Prerequisite or concurrent enrollment: Biol 319. (3F)

370. Predental Orientation. An introduction for the predental student to the dental professional curriculum and to the nature of the dental profession. Prerequisite: permission of instructor. (3F)

386. General Ecology for Life Science Majors. Interrelationships among microorganisms, plants and animals, and their environments at the level of individual organisms; species populations and ecosystems with emphasis on the structure and function of the latter two, and human implications. (4F,W)

387. Field Ecology. Sampling theory and methods in ecology; characteristics of aquatic, desert, and montane ecosystems. Prerequisites: Biol 127 and 386. Recommended: Stat 201 and 301. (2Sp)

391. Independent Study. Directed individual or group study in biology. Prerequisites: Biol 127 and consent of instructor. May be repeated for credit, but maximum of 3 credits acceptable for meeting biology requirements. (1-6F,W,Sp,Su) ®

425. Advanced Internship/Co-op. An internship/cooperative education work experience in biology at an increased level of complexity where the student should gain a more professional level of experience. (1-9F,W,Sp,Su) ®

479. Readings in Biology. (1-2F,W,Sp,Su)

480. Undergraduate Research. Special directed studies on current problems and research in biology utilizing the literature, seminar, or laboratory as determined by discussion with faculty. Prerequisites: Biol 127 and consent of instructor. May be repeated for credit, but maximum of 3 credits acceptable for meeting biology degree requirements. (1-6F,W,Sp,Su) ®

482. Clinical Dental Observation. The student will observe and work under the direction of a practicing dentist to evaluate the student's interest and commitment to dentistry. Prerequisite: Biol 370. (2W)

483. Natural History Excursion. Field trip supervised by accompanying multidisciplinary faculty group. Preparatory study and written reports required. (1-3Sp) ®

485. Teaching Internship. A program in which advanced undergraduates function as teaching interns under the supervision of a faculty member. Prerequisite: permission of the department head. A maximum of 2 credits applicable to biology degree requirements. (2F,W,Sp,Su) ®

488. Topics in Biology (Topic). (1-6F,W,Sp)

490. Bachelor's Thesis. Preparation of a written thesis based upon individual investigation under the supervision of a faculty committee. Prerequisites: 6 credits of Biol 480 and consent of faculty sponsor. (3F,W,Sp,Su)

505. Radiological Health and Safety. Required for authorization to utilize radioactive materials at USU, this course introduces the concepts of fundamental radioactivity, radiation detection, radiology, and practical health physics. Prerequisites: Phyx 113 and Biol 125. (3F,Sp)

507. Elementary Models in Ecology. Elementary models in population and community ecology explored through computer simulation. Random and deterministic populations, competition, predation, food webs, and islands. No programming required. Prerequisite: Biol 386. (3W)

516. Methods in Biotechnology: Cell Culture. Laboratory-intensive course in basic and applied methods of culturing cells (mammalian, insect, plant) and methods of fusing and transforming cells. Prerequisites: Biol 125 or ADVS 316 or equivalent, or permission of instructor. (3W)

517 (d617).[1] Introductory Population Genetics. Theoretical and applied aspects of population genetic structure, mating systems, selection, mutation, gene flow, genetic drift, molecular evolution, quantitative and conservation genetics. Prerequisite: Biol 319. (3W)

519. Molecular Genetics. Molecular aspects of genetics, including DNA replication, structure, rearrangement, transposition, recombination, repair, genetic engineering, and gene expression. Prerequisites: Biol 319 and Chem 370. (3W)

521. Cell Biology. Study of cells: structure, functions, and organization. Deals with microorganisms, plant and animal cells. Prerequisite: Biol 319. (3W)

522. Cell Biology Laboratory. Cell and molecular biological experimental methods for investigating fundamental processes in eukaryotic cells. Prerequisite or concurrent enrollment: Biol 521. (2W)

523. Developmental Biology. Study of the subcellular, cellular, and tissue-level phenomena that result in integrated organisms, using plant, animal, and microbial models. Mechanisms, rather that descriptions, will be emphasized. Prerequisites: Biol 319 and 521. (3F)

524. Methods in Biotechnology: Protein Purification Techniques. Laboratory-oriented course designed to provide basic knowledge in protein purification, analysis, and its scale up. Prerequisites: Chem 370 or ADVS 316, or permission of instructor. (3Sp)

525. Evolutionary Biology. Current developments in evolutionary biology. Considers topics from molecular to macroevolutionary scales. Prerequisites: Biol 319 and 386. (3W)

526. Methods in Biotechnology: Molecular Cloning. Laboratory-oriented course in molecular cloning techniques such as DNA cloning, genetic probes, PCR, DNA sequencing. Prerequisites: Chem 370 or Biol 319 and Micb 301 or equivalent, ADVS 316, or permission of instructor. (3F)

****IO 533. History of Biology.** Historical development of the biological world view from primitive animism to modern reductionism, with emphasis on the origins and impact of major biological theories. (3Sp)

564. Techniques of Electron Microscopy. Applications of techniques used in preparing samples for electron microscopy and those necessary for examination and photography with the transmission electron microscope. One lecture, two labs. (3F)

576. Modeling Biological Systems. Introduction to mathematical and computer modeling of biological systems, emphasizing ecological systems. Prerequisites: Math 216 or 221, at least one upper-division course in Natural Resources or Biology, Stat 301, and computer programming or permission of instructor. Three lectures, one recitation. (4F)

****577. Modeling Forest Dynamics.** Theory and methods of forest succession modeling. Analysis and construction of tree and forest ecosystem simulation models. Emphasis on methods and application. Prerequisites: Biol 386, Math 215, Stat 301, and CS 241. (3Sp)

Graduate[2]

617 (d517). Introductory Population Genetics. (3W)

618. Molecular Population Genetics Laboratory. (5F)

621. Advanced Cell Biology. (4Sp)

625. Graduate Internship/Co-op. (1-9F,W,Sp,Su) ®

630. Evolutionary Ecology. (3F)

640. Radiotracer Techniques. (2W)

642. Behavioral Ecology. (3W)

662. Scanning Electron Microscopy. (3Su)

663. Transmission Electron Microscopy. (3)

664. Electron Microscope Histology. (3)

674. Molecular Biology Laboratory. (3Sp)

675. Topics in Biology (Topic). (1-6F,W,Sp,Su) ®

680. Biology Seminar. (1) ®

687. Ecology Seminar. (1) ®

689. Molecular Biology Seminar. (1F,W,Sp,Su) ®

691. Special Problems. (1-6F,W,Sp,Su) ®

****693. Presentation and Publication in the Life Sciences.** (3F)

697. Thesis Research. (1-12) ®

699. Continuing Graduate Advisement. (1-3) ®

797. Dissertation Research. (1-12) ®

799. Continuing Graduate Advisement. (1-3) ®

Botany Courses

221. Plants of Utah. Recognition of Utah's common plants; discussion of factors affecting their distribution and their adaptive characteristics. Not available for credit to those who have completed Bot 420. (3Su)

420. Taxonomy of Vascular Plants. Principles of vascular plant identification and nomenclature. Identification of common families and use of technical keys. Three lectures, two labs. Prerequisite: Biol 126. (5Sp)

422. Agrostology. Identification of grasses using technical keys; current concepts in the taxonomy of grasses. Prerequisite: Biol 126. One lecture, two labs. (3W)

440. Plant Physiology. Introduction to plant metabolism, water relations, and growth. Prerequisites: Biol 126; Chem 141 or 231. (5W)

490. Undergraduate Seminar. (1F) ®

510. Plant Anatomy. Structure and development as related to function of major cell types and tissues; comparative anatomy of stem, root, leaf, flower, fruit, and seed in angiosperms. Three lectures, two labs. Prerequisite: Biol 126. (5Sp)

560. Principles of Plant Pathology. Fundamental principles underlying disease in plants. Prerequisite: Biol 126. (5F)

563. Forest Pathology. Nature, cause, and control of diseases affecting forest trees. Prerequisites: Biol 126; Bot 560 (may be concurrent). Two lectures, two labs. Also listed as FR 563. (4W)

Graduate[2]

***612. Ecological Plant Morphology and Anatomy.** (3W)

***621. Principles and Practice of Plant Systematics.** (5F)

***629. Plant Molecular Biology.** (4F)

***641. Plant-water Relationships.** (3Sp)

****645. Photosynthesis.** (3Sp)

****650. Molecular Events in Plant-microbe Interactions.** (3)

651. Field Plant Pathology. (3)

690. Plant Biology Seminar. (1) ®

691. Special Problems in Botany. (1-6F,W,Sp,Su) ®

692. Plant Pathology Seminar. (1) ®

Entomology Courses

LS 229. Insect Biology. Insects, their impact upon society and the environment, and the biological bases for their importance. Two lectures, one lab. Prerequisite: Biol 101. (3Sp)

441 (d641).[1] Insect Pest Management. Theory and practice of integrated pest management. Includes recognition, damage, benefits, and control of insects. Three lectures, one lab. Prerequisite: Ent 229 or Biol 125. (4F)

530. Insect Taxonomy. Classification, identification of insects to family, including basic external morphology. Collection required. Three lectures, one lab. Prerequisite: Biol 127. (4F)

****532. Insect Physiology and Internal Anatomy.** Function and structure of the organ systems of insects, illustrating tissue to subcellular coordination of physiology. Three lectures, two labs. Prerequisite: Biol 127. (5W)

***534. Insect Ecology.** Examines the distribution and abundance of insects in natural and agroecosystems. Topics include population dynamics, life-history adaptations, species interactions, and community structure. Two lectures, one lab. Prerequisites: Ent 229 or Biol 386. (4F)

535. Medical and Veterinary Entomology. Arthropods affecting the health of man and other animals. Includes life history, recognition, disease transmission and control. Two lectures, two labs. Prerequisite: Ent 229 or Biol 127. (4W)

537. Aquatic Entomology. Recognition, habitats, adaptations, and life histories of aquatic insects. One lecture, two labs. Prerequisite: Ent 229. (3Sp)

***540. Forest Entomology.** Life histories, ecological relationships, and recognition of major beneficial and harmful forest insects. Two lectures, two labs. Prerequisite: Ent 229 or Biol 125. (4F)

Graduate[2]

630. Advanced Systematics. (3)

***634. Insect-plant Interactions.** (3)

****635. Insecticide Toxicology.** (3)

636. Experimental Entomology. (3)

****637. Theory and Practice of Biological Control.** (3)

***639. Insect Ecophysiology and Behavior.** (3)

641 (d441). Insect Pest Management. (4F)

685. Seminar in Entomology. (1) ®

691. Special Problems in Entomology. (1-6F,W,Sp,Su) ®

Microbiology Courses

LS 111. Elementary Microbiology. Biology and role of microorganisms in natural processes. Not intended for biology majors, who should take Micb 301. May be used as a prerequisite (together with Micb 112) only for Micb 530 and 560. (4F) ©

LS 112. Elementary Microbiology Laboratory. Nature of microorganisms, media preparation, and laboratory techniques. Accompanies Micb 111 which must be taken as a prerequisite or concurrently. (1F)

301. Microbiology I. Microbes, their ecology, biology, and role in nature. Emphasis on the bacteria. Three lectures, two labs. Prerequisites: Biol 126; Chem 141 or 231. (4F,W)

401. Microbiology II. Physiology, genetics, and structure of selected prokaryotic microbes and the viruses. Three lectures, two labs. Prerequisites: Micb 301 and Biol 319; Chem 233 or 370 recommended. (5W)

***501. Mycology.** Taxonomy, morphology, genetics, and physiology of the fungi. Special attention to forms important in agriculture, medicine, and industry. Three lectures, two labs. Prerequisite: Biol 126. (5W)

502. Pathogenic Microbiology. Properties of pathogens and their relationships to infectious diseases. Four lectures, one lab. Prerequisite: Micb 301. (5W)

503. Immunology. The immune response in the host animal and immunologic procedures. Prerequisites: Biol 127, 319. (5Sp)

***530 (d630)[1]. Soil Microbiology.** Activities and ecology of microorganisms related to the soil environment, soil fertility, soil organic matter, rhizosphere, and soil amendments. Prerequisites: Biol 125; Chem 141 or 231. (3W)

***531 (d631). Soil Microbiology Laboratory.** Application of soil microbiological techniques. Two labs. Prerequisite: Micb/Soil 530 taken concurrently or previously. (2W)

560. Aquatic Microbiology. Principles of microbiology relevant to the aquatic environment. Emphasis on fresh water and waste water. Prerequisite: Micb 111 or 301. (3Sp)

561. Aquatic Microbiology Laboratory. Application of aquatic microbial techniques. Two 1.5-hour labs per week. Prerequisite: Micb 112 or 301; and Micb 560 concurrent or previously. (1Sp)

570. Virology. Structure, replication, genetics, and molecular biology of viruses; virus-host interactions; viral diseases and antiviral agents. Prerequisites: Micb 301 and Biol 319; Micb 401 recommended. (4Sp)

571. Virology Laboratory. Introduction to laboratory techniques using bacterial and animal viruses. Prerequisite: previous or concurrent enrollment in Micb 570. (2Sp)

Graduate[2]

****603. Advanced Immunology.** (2F)

***630 (d530). Soil Microbiology.** (3W)

***631 (d531). Soil Microbiology Laboratory.** (2W)

****635. Soil and Environmental Biogeochemistry.** (3W)

***670. Advanced Animal Virology.** (3F)

691. Special Problems in Microbiology. (1-6) ®

780. Seminar. (1) ®

Physiology Courses

LS 103. Human Anatomy. Structure of the main human body systems with emphasis on the muscular, skeletal, and nervous systems. Four lectures, one lab. (5Sp,Su)

LS 130. Human Physiology. Functioning of the human body, with emphasis upon major organ systems. Five lectures, one lab. (5F,W,Sp,Su) ©

IO 135. Brain and Behavior. An introductory survey of human brain structure and function. Behavioral issues will encompass learning, development-senescence, genetics-environment, drugs, and mental diseases. Lectures, discussions, videos. (5F)

400. Human Dissection. Skeletal anatomy and prosection of the human body. One lecture, one lab. Prerequisite: Phyl 103. (2W)

404. Comparative Animal Physiology. Survey of physiological adaptations of animal organ systems (respiratory, excretory, circulatory, digestive, and integrative) to environmental variables. Prerequisite: Biol 127. (3Sp)

501. Mammalian Physiology I. An intensive, detailed study of membrane physiology, muscle, neurophysiology, sensory physiology, excretion, and body fluids. Prerequisites: Biol 127, 521; Chem 160; Phyx 101 or 120, or Phyx 113 or 223. (4F)

502. Mammalian Physiology II. An intensive, detailed study of metabolism, thermoregulation, digestion, respiration, circulation, and the cardiovascular system. Prerequisite: Phyl 501. (4W)

503. Endocrinology. Ductless glands and their secretions. Emphasis is placed on the action of these hormones on growth, metabolism, and adaptation of animals to changes in the internal and external environments. Three lectures, one lab. Prerequisites: Biol 127 and Chem 232. (4Sp)

505. Animal Physiology Laboratory. Intensive, hands-on course using classical preparations to train students in experimental design, data analysis, and writing research reports. Prerequisite: Phyl 404 or 501. Recommended: Phyl 502. (2Sp)

Graduate[2]

****605. Ecological Vertebrate Physiology.** (5)

****620. Physiology of Reproduction.** (4)

686. Seminar in Physiology. (1) ®

691. Special Problems in Physiology. (1-6F,W,Sp,Su) ®

695. Readings in Physiology. (1) ®

Public Health Courses

115. Personal Health. Health problems of university students; especially for freshmen and sophomores. (2W) ©

302. Family and Community Health. Focus on health of various population groups within the community. Particular emphasis is placed on guidelines for optimal family health. (3Sp)

304. School Health Program for Elementary and Secondary Teachers. Instruction of elementary and secondary teachers in utilization of available health services, maintenance of a healthful environment, and prevention of health problems in school-age youth. (3Sp) ©

349. Introduction to Occupational Health and Safety. A study of health and safety problems encountered in industry and various occupations. (3F) ©

470. Public Health Field Experience. Laboratory and field experience in the practice of public health. (3-18F,W,Sp,Su) ®

499. Special Problems in Public Health. (1-5F,W,Sp,Su) ®

510. Environmental Health. The effect of environment on man's health together with control measures applied. Includes water, air, refuse, industrial hygiene, radiation, insects, and rodents. Three lectures, one lab. Prerequisites: Biol 127; Micb 112 or 301; Chem 141 or 231. (4Sp)

512. Communicable Disease Control. Mechanisms of transmission, control, and prevention of communicable diseases. (3F) ©

516. Food-borne Disease Control. Principles of food-borne disease transmission, control, and enforcement. Prerequisite: Micb 112 or 301. (3Sp)

530. Fundamentals of Epidemiology. Introduction to the study of the distribution and causes of communicable and noncommunicable diseases in man and other animals. Two lectures; one lab. Prerequisites: Stat 201 and PubH 512. (3W) ©

540. Industrial Hygiene. Fundamentals of industrial hygiene including recognition, evaluation, and control of chemical, biological, and physical agents affecting the health of workers. Three lectures, one lab. Prerequisites: Biol 127 and Chem 231. (4F)

541. Industrial Hygiene Instrumentation and Sampling. Practical experience in the application of industrial hygiene field sampling methodologies and utilization of basic sampling instrumentation. Prerequisite: PubH 540. (3W)

542. Industrial Hygiene Hazard Control. Design and economic considerations affecting the control of chemical health hazards of various industrial processes, with an emphasis on ventilation. Prerequisite: PubH 541. (3Sp)

580. Seminar in Health Problems. (1Sp) ®

Graduate[2]

691. Special Problems in Public Health. (1-6F,W,Sp,Su) ®

Zoology Courses

350. Vertebrate Biology. Topics in evolutionary biology and adaptive physiology of the vertebrates. Three lectures, two labs or field trips. Prerequisite: Biol 127. (5F)

461. Field Ornithology. Identification, adaptations, and habitat distribution of the birds of Western North America. Census and monitoring techniques. (3Sp)

551. Invertebrate Zoology. The more important phyla of invertebrates, with some consideration of local fauna. Three lectures, two labs. Prerequisite: Biol 127. (5Sp)

555. Parasitology. Life cycles, clinical significance and taxonomy of medically important worms, arthropods, and protozoa parasitizing humans and, to a lesser extent, domestic animals. Three lectures, two labs. Prerequisite: Biol 127. (5Sp)

561. Avian Biology. Structure, function, classification, physiology, behavior, and ecology of birds. Two lectures, one lab. Prerequisite: Biol 127. (3Sp)

563. Mammalogy. Adaptations, classification, distribution of mammals. Three lectures, two labs. Prerequisite: Biol 127. (5F)

573. Herpetology. Classification, distribution, life habitats, and identification of amphibians and reptiles, with emphasis on local forms. Three lectures, one lab. Prerequisite: Biol 127. (4Sp)

580 (d680).[1] Animal Community Ecology. Principles of ecological interactions among animals, emphasizing controversies and modern approaches. Lectures and group discussion of current literature. Undergraduates should use 580; graduates should use 680. Prerequisite: Biol 386. (4W)

Graduate[2]

680 (d580). Animal Community Ecology. (4W)

681. Seminar in Vertebrate Zoology. (1) ®

691. Special Problems in Zoology. (1-6) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

*Taught 1996-97.

**Taught 1997-98.

Department of

Business Administration

College of Business

Head: Professor Philip R. Swensen
Office in Business 811, 797-2362

Professors Peter M. Ellis, Allen D. Kartchner, J. Robert Malko, C.R. Michael Parent, Paul A. Randle; **Associate Professors** Drew Dahl, Alan A. Stephens; **Assistant Professors** Kenneth R. Bartkus, Cathy Hartman, Edwin R. Stafford; **Adviser** Madeline Thimmes

Degrees offered: Bachelor of Science (BS) and Bachelor of Arts (BA) in Business Administration, Finance, Marketing, and Production Management

Objectives

The business administration program is designed to prepare men and women for administrative positions in business, government, and other institutions. Specialized training is provided within specific functional fields for business, as well as training directed at understanding the broader aspects of business as it functions within our free enterprise environment. Training is specifically provided in three areas: (1) **Finance,** leading to careers in banking, brokerage activities and investment, and positions as financial analysts in industry; (2) **Marketing,** involving positions in sales, advertising, retailing, traffic and transportation, and other similar activities; (3) **Production Management,** leading to employment as a foreman on a production line or in one of the production activities such as scheduling, procurement, time and motion studies, quality control, or inventory control.

Requirements

Departmental Admission Requirements. New freshmen admitted to USU in good standing qualify for admission to the College of Business. Students with 1-69 quarter hours of credit, who are transferring from other institutions or from other colleges at USU, need a minimum overall GPA of 2.20. Students transferring with 70 or more quarter hours of credit are required to have a minimum overall GPA of 2.50. Upon admission, all degree-seeking students will be identified with the College of Business Prespecialization Unit for the purpose of qualifying for advanced standing within their chosen major field. Transfer students and others desiring to be admitted to advanced standing in the Department of Business Administration must meet the prespecialization requirements stated below.

Prespecialization. For approximately the first two years, a student will be identified with the College of Business Prespecialization Registration Unit, which is administered by the College of Business Student Service Center, Business 306. The basic objective of this portion of the student's studies is to provide a broad and sound educational foundation upon which to build a specialized education relating to business.

All students at the University are required to satisfy the General Education requirements of the University as described in the General Education section of this catalog. Additional requirements for Business Administration majors during this period consist of two basic components.

1. College of Business Prespecialization Core. The following courses are required: Acct 201, 203; BIS 140, 255; Econ 200, 201; Math 105; BA 100; MHR 299; CS 150 or 170; Stat 230.

2. Department of Business Administration Prespecialization Requirement. The following courses are required for Business Administration majors: Math 215; Soc 101 or Psy 101; Spch 260 or BIS 245.

Completion of 30 credit hours of university work with a minimum GPA of 2.2 is necessary before a student is allowed to enroll in BIS 255; Acct 201, 203; and MHR 299.

Access to 300-level Business Administration courses is restricted. Only those students who have completed a minimum of sixty (60) quarter credits with a minimum GPA of 2.50 will be allowed to enroll in 300-level Business Administration courses, with the exception of BA 346.

Advanced Standing. The objective of the advanced standing portion of the program is to provide sufficient specialized business training to prepare the student to successfully enter the business world in a chosen field of interest. The program is also directed at providing the type of business education that develops the attitudes, analytical ability, and the social conscience required for future professional advancement.

The requirements for attaining unconditional advanced standing in the Department of Business Administration are as follows:

1. Have completed a minimum of 85 credits and must have earned an overall grade point average (GPA) of 2.50 for **all** the hours of study taken up to the time the petition for advanced standing is made. This includes all transfer credits.

2. Have completed the prespecialization requirements for both the College of Business and the Department of Business Administration, as indicated above, and must have earned a GPA of 2.50 or above in these courses.

3. File a request for advanced standing with the College of Business Student Service Center, Business 306.

It is strongly recommended that each student make the transition from prespecialization in the college to advanced standing in the Department of Business Administration as soon as possible after having met the 85 credit requirement.

During the initial portion of the Business Administration upper-division program, all degree seeking students will be required to take the following core classes, which are designed to provide a broad background in the various areas of business: BA 308, 340, 350, 370; MHR 311, 412, 489[1]; Econ 340; Econ 400 or 500; Econ 401 or 501.

[1]The MHR 489 Business Policy course is a capstone course and should not be taken until near the end of the senior year.

College of Business Enrollment Restrictions. Admission to the college does not insure access to the prespecialization core courses required for graduation. The following requirements must be met:

1. An overall GPA (transfer credits included) of 2.20 and 30 credits of completed college-level work are required for admission into Acct 201, 203; MHR 299; and BIS 255.

2. An overall GPA of 2.50 and completion of 45 credits are required for admission into Acct 311 and 331.

3. An overall GPA of 2.50 and completion of 60 credits are required for admission into Acct 312, 313, 332, 341; BA 308, 340, 350, 370; BIS 310, 314, 330, 355, 371; Econ 340; and MHR 311, 360.

4. All 400- and 500-level courses in the College of Business, with the exception of Economics courses and MHR 489, are restricted to students with unconditional advanced standing. A 2.50 overall GPA and completion of 90 credits are required for admission into these courses.

5. An overall GPA of 2.50 and completion of 125 credits are required for admission into MHR 489.

During the latter portion of the program, the student working toward a degree in the Department of Business Administration will be devoting his or her efforts toward fulfilling the requirements in one of the three areas of specialization.

Finance Major. Finance deals with means of allocating financial resources efficiently in our economy on both the micro and macro levels. In addition to the basic core requirements, students majoring in finance must take BA 441, 444, 445, and 446. Also, students must take three courses from BA 430, 442, 443, and 448; Acct 331 and 341; and Econ 403 and 560. In addition to the required courses, it is recommended that the finance major take additional work in mathematics, statistics, computer science, and accounting.

Marketing Major. Modern marketing consists of a system of activities designed to understand and influence buyer and seller behavior. Within the socio-economic and political environment, the marketer must plan, price, promote, and distribute want-satisfying goods and services to society. The following courses are designed to prepare students in all areas of marketing and must be taken in addition to the basic core: junior year—BA 451 and 453; senior year—BA 454, 455, and 459.

Production Management Major. Production management involves the planning, directing, and controlling of activities related to production. Required courses are junior year—MHR 360, BA 475; senior year—BA 573, Econ 521, BA 472. In addition, two courses must be selected from MHR 364; Acct 331; BIS 310; ITE 458; MAE 211 or ITE 103.

Business Administration Major. A degree in business administration is available for those students who have a special career objective that does not fit the other majors. A proposal designed by the student is submitted to the department head for approval.

Those seeking a second bachelor's degree or those proposing a unique program of their own must have the approval of the head of the department. Those proposing their own program must provide a written justification and list of courses. Instructions are available in the departmental office.

Business Administration Minor. A solid minor in business administration can be extremely valuable when linked with any major. Students who expect to operate their own business or professional office would be well-served to have some business courses. The Business Administration Department offers minors in Business Administration, Marketing, Finance, or Production.

The business administration minor consists of three required courses (BA 340, 350, and 370) and three additional courses selected from the following list: BA 441, 444, 445, 451, 454, 455, 472, 475, and 573. A grade point average of 2.50 in the six courses is required. Many of these courses have prerequisites, and it is not assumed that all students will be able to select freely from the list. Most courses require at least Math 105 as a level of math competence.

Marketing Minor. BA 340, 350, 370, 451, 453 or 454, 455.

Finance Minor. BA 340, 350, 370, 441, 444, 445.

Production Minor. BA 340, 350, 370, 472, 475, 573.

Students with majors from outside the College of Business may elect a college minor consisting of a broader spectrum of courses from all the departments within the College of Business.

Graduation Requirements. To be recommended by the department for graduation, business administration majors must have a grade point average of at least 2.50 in their core and specialty courses, as well as an overall GPA of 2.50. This includes transfer credit. The College of Business requires that at least 93 quarter credits be taken in courses taught outside the College of Business. Up to 14 quarter credits (9 semester credits) of economics and 9 quarter credits (6 semester credits) of statistics can be considered as courses taught outside the College of Business. At least fifty percent of the business credits required for a business degree must be taken on the Utah State University campus or at a designated residence center.

Graduate Study

The college offers the Master of Business Administration degree (MBA). It is designed to give the student training of a general management nature aimed at providing a background for advancement into supervisory positions. The MBA degree does not emphasize narrow specialization in any one of the functional fields of business; rather it is a management degree emphasizing broad training obtainable by qualified students regardless of their undergraduate major. See *Graduate Catalog* for more information.

Business Administration Courses

100. Business Orientation. Orients freshmen and transfer students to College of Business programs, academic and student services, professional organizations, and career possibilities. (1F,W,Sp)

SS 135. Introduction to Business. An investigation of the role of business in contemporary society, including an introduction to the general problems of business operation. (3F,W,Su) ©

225. Introductory Internship. An introductory level experience in a career-related position approved by the cooperative internship office. One credit for every 75 hours of internship experience. Maximum 6 credits. (1-6F,W,Sp,Su) ®

308. Operations Research. Quantitative methods for resource allocation: linear programming, queueing theory, simulation, Markov chains, etc. Prerequisite: Stat 230 or 301. (4F,W,Sp,Su) ©

323. Real Estate. Introduction to real estate contracts, forms, principles, and recent federal housing legislation. (3F,W)

325. Discussions with Business Leaders. Examines new methods for improving U.S. competitiveness by attending the Partners Program seminar sessions and hosting visiting executives from top U.S. companies. Repeatable to maximum of 6 credits. (1F,W,Sp,Su) ®

340. Corporation Finance. How the corporation raises and manages its capital. A study of modern financial principles, methods, policies, and institutions. Corporate organization, creation, and reorganization. Prerequisites: Econ 201, Math 105, Acct 203. (4F,W,Sp,Su) ©

346. Fundamentals of Personal Investing. Examination of investment vehicles available to personal investor. Principal emphasis is on corporate and government securities. Credit cannot be used toward requirements for finance major. (3F)

350. Fundamentals of Marketing. Overview of the marketing function emphasizing concepts and terminology. Includes the basic marketing activities of product management, pricing, distribution, promotion, marketing research, and consumer behavior. Prerequisite: Econ 201. (4F,W,Sp,Su) ©

370. Production. Managerial aspects of production planning, procurement, inventory control, production control, quality control, layout, methods improvement, performances, standards, and basic industrial processes. Prerequisite: Stat 230 or 301. (4F,W,Sp,Su) ©

410 (d610).[1] Government Contract Administration. Provides basic information and description of the general environment and content of government contracts (primarily U.S. Government Contracts). Emphasis is on the administration of and accounting for these contracts. (4Sp)

425. Advanced Internship. An advanced or middle-level experience in a career-related internship position approved by the cooperative internship office. One credit for 75 hours of internship experience. Maximum of 12 credits. (1-12F,W,Sp,Su) ®

430. International Finance. Overview of international financial management, including international financial markets, exchange rate behavior, and financing international trade. Prerequisite: BA 340. (3Sp)

441. Financial Institutions. Defines role of major financial institutions in supplying loanable funds to consumers, business, and government. Emphasis on commercial banks as major supplier of short-term credit. Prerequisite: BA 340. (4F,W,Sp)

442. Insurance. Studied from the standpoint of the consumer of insurance services. Topics treated include types of life, property, and casualty insurance contracts; nature and uses of life and property insurance; and the organization, management, and government supervision of insurance companies. Prerequisite: BA 340. (3F)

443. Real Estate Finance. Covers the theory, principles, and techniques of real estate investment, emphasizing present value and cash-flow approaches to real estate investment decisions. Prerequisite: BA 340. (3F)

444. Financial Administration. Emphasizes working capital management and other short-term financial decisions. Prerequisite: BA 340. (4F,W)

445. Financial Policy. Emphasizes capital budgeting, capital structure, and other financial decisions having long-range implications for the firm. Prerequisite: BA 340. (4F,W,Sp)

446. Investments. Surveys the field of investments, including bonds, warrants, convertibles, options, and futures. Risks, returns, and hedging opportunities are emphasized. Prerequisite: BA 340. (3F,W)

448. Securities Analysis and Portfolio Theory. Study of modern investment analysis and portfolio theory, risk-return analysis, common stock, and bond valuation theories. Prerequisite: BA 446. (3W,Sp)

451. Consumer Behavior. Treats strategic applications of behavioral science concepts to the firm's marketing mix. Builds on concepts from psychology, sociology, anthropology, and economics. Prerequisites: BA 350, Psy 101 or Soc 101. (4F,W,Sp) ©

453. Marketing Research. The emphasis is on managing the marketing research function. Topics include basic vs. decisional research, survey research, cost vs. value of information, research design, experimentation, and analysis techniques. Prerequisite: BA 350. (4F,W,Sp)

454. Retailing Management. Investigations of retailing as one aspect of the channel of distribution. Emphasis on the areas of managerial responsibility including location, layout, buying, control, financial management, and promotion. Prerequisite: EA 350. (4F,W,Sp) ©

455. Promotion Management. Treats the management of the entire promotion function including advertising, personal selling, publicity, sales promotion, and packaging. Emphasizes integration of the promotional mix with the firm's total marketing mix. Prerequisite: BA 350. (4F,W,Sp)

459. Marketing Strategy Planning. The course follows an analytical orientation to the major marketing problems facing the firm. The emphasis is upon strategies involving the marketing mix and their impact upon performance of the firm. Prerequisites: BA 451, 453, 455. (4F,W,Sp)

472. Procurement and Production Control. Planning and direct control of materials and production activities. Includes industrial purchasing, planning and control of inventories, and planning and control of production. Prerequisite: BA 370. (5F)

475. Production Simulation. Computer simulation of production environment including scheduling, routing, labor, capacity, inventory, and delivery. Just-in-time concepts are emphasized. Prerequisite: BA 370. (3W)

480. Independent Research and Reading. (1-5F,W,Sp,Su) ®

485H. Senior Honors Seminar. Presentation of senior thesis project created in the 495H course. Focus is on scholarly approach, problem definition, and methodology. (1Sp)

495H. Senior Honors Thesis. Creative project that will then be written up as a Senior Thesis as required for an Honors Plan. (3-9F,W)

573. Management of Quality. This course develops methods and procedures for design, implementation, and control of TQA (Total Quality Assurance) programs in both product and service organizations. Prerequisite: Stat 230. (3W)

Graduate[2]

607. Survey of Corporation Finance. Taught only in Ogden. (3)

608. Survey of Marketing. Taught only in Ogden. (3)

610 (d410). Government Contract Administration. (4Sp)

635. Managerial Economics. (3)

642. Finance Problems. (4)

644. Special Topics in Finance. (3)

645. Investment Theory. (3)

652. Marketing Strategy. (4)

654. Special Topics in Marketing. (3)

672. Operations Management. (4)

674. Special Topics in Operations Management. (3)

690. Independent Research and Reading. (1-5) ®

696. Professional Paper. (4)

697. Thesis. (1-9) ®

699. Continuing Graduate Advisement. (1-3) ®

760. Seminar in Financial Topics. (3)

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

Department of

Business Information Systems and Education

College of Business

Head: Professor Lloyd W. Bartholome
Office in Business 711, 797-2342

Cooperative Education Supervisor: Melissa Huntington
Office in Business 202, 797-0333

Microcomputer Laboratory Supervisor: James N. Elwood
Office in Business 103, 797-2270

Professors James Calvert Scott, H. Robert Stocker, William A. Stull, John F. Vinsonhaler; **Associate Professors** Thomas Hilton, Dennis LaBonty, Charles M. Lutz; **Associate Professor Emeritus** Floris S. Henderson; **Assistant Professor** Jeffrey J. Johnson; **Lecturers** Charles R. Jones, Marianna Larsen, Craig J. Peterson, Susan M. Richards, Dana H. Swensen

Degrees offered: Bachelor of Science (BS) and Bachelor of Arts (BA) in Business Education; BS and BA in Marketing Education; BS and BA in Business Information Systems; Master of Science (MS) in Business Information Systems and Education with specializations in Business Communications, Business Information Systems, Information Systems Management, Business Marketing Education, Training and Development, Vocational Education; Master of Education (MEd) in Secondary Education with specialization in Business Education; participates in the College of Education Interdepartmental Doctor of Philosophy (PhD) and Doctor of Education (EdD) in Business Information Systems and Education with emphases in Business Communications, Information Systems Management, Marketing Education

Two-year Associate of Applied Science Degree: Office Systems Support

Objectives

The Department of Business Information Systems and Education offers two major educational thrusts in undergraduate as well as graduate programs. The Business Information Systems major is designed to prepare individuals for positions as managers in business information systems including information managers, information supervisors, systems analysts, applications programmers, systems trainers, and office systems managers by pursuing a bachelor's degree program in Business Information Systems.

The second major thrust is designed to prepare individuals as teachers and supervisors of business and marketing subjects at the secondary and postsecondary grade levels in the educational system or as teacher-trainers in private industry. Students may earn a bachelor's degree in Business Education or Marketing Education.

A comprehensive two-year Associate of Applied Science Degree in office systems support subjects is also available. In addition, the department provides service courses for many other groups of students.

The department has a modern microcomputer laboratory in seven separate rooms with more than 200 microcomputers. Students take microcomputer classes as part of their College of Business requirements, general education, and elective programs.

Requirements

College and Departmental Admission Requirements

Bachelor's Degree Programs. *Admission:* New freshmen admitted to USU in good standing qualify for admission to the College of Business. Students with 1-69 quarter hours of credit, who are transferring from other institutions or from other colleges at USU, need a minimum overall GPA of 2.20. Students transferring with 70 or more quarter hours of credit are required to have a minimum overall GPA of 2.50.

Advanced Standing: Those students with four-year degree goals in Business Information Systems, Business Education, and Marketing Education shall successfully complete prespecialization requirements before being admitted to unconditional advanced standing. Criteria for entrance to advanced work in an area of specialization (major) requires (a) completion of the first 30 or more credit hours of university work with a minimum GPA of 2.20 before being allowed to take certain required 200-level courses in the College of Business, (b) completion of at least 85 credits, (c) minimum of 2.50 overall grade point average for all hours of study taken up to the time the petition for advanced standing is made (including all transfer credits), (d) completion of specified prespecialization courses with a minimum of 2.50 grade point average.

Enrollment Restrictions: Admission to the college does not insure access to the College of Business courses required for graduation. The following requirements must be met:

1. An overall GPA (transfer credits included) of 2.20 and 30 credits of completed college-level work are required for admission into Acct 201, 203; MHR 299; and BIS 255.

2. An overall GPA of 2.50 and completion of 45 credits are required for admission into Acct 311 and 331.

3. An overall GPA of 2.50 and completion of 60 credits are required for admission into Acct 312, 313, 332, 341; BA 308, 340, 350, 370; BIS 310, 314, 330, 355, 371; Econ 340; and MHR 311, 360.

4. All 400- and 500-level courses in the College of Business, with the exception of Economics courses and MHR 489, are restricted to students with unconditional advanced standing. A 2.50 overall GPA and completion of 90 credits are required for admission into these courses.

5. An overall GPA of 2.50 and completion of 125 credits are required for admission into MHR 489.

See the College of Business section in this catalog for listing of prespecialization requirements for all business majors. In addition, Business Information Systems majors must take BIS 310 and must take or test out of BIS 111.

Persons planning to teach must also be admitted to the teacher certification program in the College of Education. A cumulative college grade point average of 2.75 is required to be admitted to the College of Education, to student teach, and to graduate in Business Education or Marketing Education with a teaching certificate. Detailed information may be obtained from the Department of Secondary Education and/or College of Education.

Two-year Associate of Applied Science Degree. Students indicating an interest in the Office Systems Support Associate of Applied Science Degree can be accepted directly into the program upon admission to the University. Students who desire to transfer to a four-year program offered by the College of Business must meet the requirements specified for bachelor's degree programs.

Competency-based Placement Program. Students who have acquired knowledge and skills that are not represented on their collegiate transcripts of credit are allowed to demonstrate competency by challenging related courses. Placement in a skills-oriented sequence can be accomplished by discussion with an adviser. Challenge of courses is done by successfully completing an examination similar to a final course test.

Students with potential for demonstrating competence have two options, one of which must be chosen prior to examination. One option is to challenge for credit (*P/D+, D, F* option) according to University established procedures; results of the test are recorded on the student's transcript. There is a fee for this option. A second option is to waive without credit required classes, if competence at the *B* level is demonstrated.

Program Requirements

Bachelor's Degree in Business Information Systems. The Information Systems program at Utah State University offers a common core of courses through two departmental majors, Business Information Systems and Education and Computer Science. The curricula of the individual departments differ substantially in emphasis.

The **Business Information Systems major, Information Systems Management emphasis,** is offered in the Business Information Systems and Education Department, College of Business. The Bachelor of Science or Bachelor of Arts program is designed for students interested in business careers as information specialists, systems analysts, applications programmers, and information systems managers in business and industry. BIS majors take required courses in analysis and design, decision support systems, spreadsheet and database applications, and information systems projects. All graduates are required to complete a common core of business subjects. The College of Business is accredited by the American Assembly of Collegiate Schools of Business. The department also offers a master of science in Business Information Systems and Education with an area of emphasis in Information Systems Management.

The **Computer Science major with an Information Systems option** is designed for students interested in a career as a Computer Scientist with a background in Information Sciences and Systems. Majors in this option are trained in all phases of the analysis, design, and implementation of Information Systems. As part of this option, students also receive training in the theory and application of information with courses in Telecommunications and Expert Systems. Students select an application area such as Business, Accounting, or Economics. Other application areas can be developed by working closely with an adviser. This program of study, offered within the College of Science, leads to a Bachelor of Science, Bachelor of Arts, or Master of Science degree in Computer Science. See page 110 for additional details.

General requirements for all Business Information Systems majors are: Acct 201, 203; BIS 100, 140, 230, 245, 255, 310, 330, 350, 410, 425, 505, 510, 541, 570; BA 340, 350, 370; MHR 299, 311, 489; Math 215 (prerequisite: Math 105 or equivalent); Stat 230; Econ 200*, 201, 340; and University general education requirements.

Students must choose either an information systems management emphasis or an office systems management emphasis.

The **information systems management** emphasis provides knowledge and skills for business systems analysts, applications programmers, information managers, and other business information systems positions.

Required classes for the information systems management emphasis are: CS 170*, 171, 227, 251 or 252; BIS 520, 530; plus 9 credits outside the College of Business related to the major. It is strongly recommended that students take BA 308 and BIS 515. See adviser for current checklist of requirements.

The **office systems management** emphasis provides knowledge and skills for office managers, administrative assistants, and other practitioners who assist with analysis, design, and use of computerized information from a user's perspective.

Required classes for the office systems management emphasis are: BIS 112, 142, 240, 252, 260; CS 150* or 170*; MHR 360; plus 9 credits of approved upper-division classes outside the College of Business related to the major. BIS 520 and 530 are strongly recommended. See adviser for current checklist of requirements.

Bachelor's Degree in Business Education. A composite major in Business Education is designed for students desiring to qualify for a certificate to teach business subjects in grades 7-12 or to teach in business and industry. Required courses include: BIS 100, 140, 225 or 425, 230, 240, 245, 255, 310, 350, 355, 455, 520, 530; Stat 230 (or Psy 380); BA 340, 350; MHR 299, 311, 489; Acct 201, 203; Econ 200, 201, 340; and other general education required by the University. Required English classes are Engl 101 or 111 and Engl 200 or 201. Students must also complete at least one of the following options:

1. Business Data Processing and Information Management Option: BIS 112, 142, 252, 260, 330, 541.

2. Basic Business and Accounting Option: BIS 112, 314; BA 370; MHR 235 or BA 454; Econ elective of 3 or more credits.

Additional courses for meeting certification and graduation requirements include: ScEd 301, 302, 404, 510; Psy 101 and 366; BIS 300, 303, 450, 460, 561, 572, 573; SpEd 301; InsT 445, 447. Those who do not wish to certify to teach in the public schools may select an emphasis in training and development for business and industry. Current requirements are listed on the major requirement sheets.

*These courses are General Education requirements.

Bachelor's Degree in Marketing Education. A composite major in marketing education is designed for students desiring to qualify for a certificate to teach marketing and distributive education subjects in the public secondary schools or in business and industry. Required courses for students wishing to certify to teach include: Acct 201 and 203; Stat 230 (or Psy 380); BA 340, 350, 370; BIS 100, 140, 225 or 425, 240, 245, 255, 455; Econ 340; MHR 299, 311, 360, and 489. Students must also take one of the following groups of classes: *Conceptual Orientation:* BIS 355, BA 451, 454, and 455; or *Applied Orientation:* 15 credits of approved marketing courses.

Additional courses for meeting certification and graduation requirements include: BIS 112, 300, 303, 450, 460, 561, 572, 573; ScEd 301, 302, 404, 510; Psy 101, 366; SpEd 301; and InsT 445, 447. Those who do not wish to certify to teach in the public schools may substitute an option in training and development for business and industry. Current requirements are listed in the major requirement sheets.

Students must also complete Engl 101 or 111 and Engl 200 or 201 as well as Econ 200, 201; Math 105; and CS 150, which may be counted toward their general education requirements.

Graduation Requirements. To be recommended by the department for graduation with a bachelor's degree, BISE majors must have an overall GPA of 2.50. This includes transfer credit. The College of Business requires that at least 93 quarter credits be taken in courses taught outside the College of Business. Up to 13.5 quarter credits (9 semester credits) of economics and 9 quarter credits (6 semester credits) of statistics can be considered as courses taught outside the College of Business. At least fifty percent of the business credits required for a business degree must be taken on the Utah State University campus or at a designated residence center.

Written communications requirements are: Engl 101 or 111 and Engl 200 or 201.

Office Systems Support Associate of Applied Science Degree. This program is designed for students desiring two years (a minimum of 96 quarter credit hours) of college to prepare for positions as office supervisors and other office and information systems support personnel. Emphasis is placed on job skills. Requirements are: BIS 100, 112, 140, 142, 155, 225, 230, 240, 252, 260; Acct 201; and Math 101 or 105. In addition, students are required to complete a minimum of 20 credit hours in a business related area as approved by their advisers. Students must also take Engl 101 or 111 **and** Engl 200 or 201.

A minimum of 20 credits of general education must be taken. Required general education classes are: 5 credits of social science; 5 credits of humanities; 5 credits of life science; and 5 credits of physical science.

Students who initially enroll for the two-year Associate of Applied Science Degree may readily change to a four-year bachelor's degree program and complete the requirements for the business information systems major, business education major, or another major in the College of Business.

Minors. The Department of Business Information Systems and Education is authorized to award teaching minors in Business Education, Marketing Education, and Business Computers and Information Systems. A minor in Business Information Systems is also authorized. Requirements for the Business Education minor are BIS 112, 140, 230, 245, 300, 310, 561, 572, 573; Acct 201, 203; Econ 200; and MHR 299. Business Education minors must also select a minimum of 9 credits from the following courses, with the prior approval of their adviser: BIS 142, 240, 252, 260, 314, 330, 350, and 520.

A minor in Marketing Education consists of the following courses: BA 350; Acct 201, 203; BIS 112, 140, 230, 240, 300, 355, 561, 572; Econ 200; MHR 299, 311.

Requirements for the Business Computers and Information Systems minor are: BIS 112, 140, 230, 240, 245, 300, 310, 350, 561, 572, 573; Acct 201, 203; CS 150; Econ 200; and MHR 299. Students must also select **at least** one course from the following: BIS 330, 410, 515, 520, 530; CS 170, 251; and InsT 516. The Business Computers and Information Systems minor is a **teaching minor** and is available only to those working for a teaching certificate.

Students wishing to minor in Business Information Systems must complete the following courses: BIS 230, 245, 310, 330, 350, and CS 251 or 252. In addition, they must choose one course from the following: BIS 240, 410, 510, 515, 520, 530, 541, 570 and CS 170. The following courses are also required for nonbusiness majors: Acct 201, 203, BIS 140, and CS 150.

Student Organizations

The Department of Business Information Systems and Education sponsors or co-sponsors four student organizations. Each group provides unique experiences that can complement and enrich formal coursework. Leadership development and human relations skills are among the personal attributes enhanced by involvement in the various organization activities.

Association for Systems Management (ASM). ASM, a professional society for the information systems industry, sponsors a student chapter at USU. The goals of ASM are to: (1) provide leadership experiences for undergraduate and graduate business information systems majors; (2) help student members plan their careers and find employment by introducing them to practicing systems professionals; and (3) foster a professional attitude among business information systems majors so that they will contribute to their field.

Phi Beta Lambda. A cocurricular student organization is Phi Beta Lambda (PBL). The organization's goal is to provide opportunities to develop business career competencies and to promote civic and personal responsibility. Membership is open to all students interested in business.

Delta Epsilon Chi (DEX) is a cocurricular organization designed for marketing education and marketing majors. The major goal of DEX is to help students prepare for careers in marketing or marketing education. DEX provides students with opportunities to compete in marketing events at the state and national levels. Membership is open to all students interested in business and marketing.

Delta Pi Epsilon is a national honorary fraternity for graduate students. Purposes of the organization include enhancement of research, scholarship, service, and cooperation in the profession. Election to membership requires review by members and faculty of the Department of Business Information Systems and Education.

Graduate Study

The Department of Business Information Systems and Education offers courses leading to the Master of Science degree in Business Information Systems and Education with concentrations in business information systems, business education, marketing education, and training and development.

The Department of Business Information Systems and Education cooperates with several other departments in offering the Doctor of Philosophy and Doctorate of Education degrees through the College of Education. Emphases are offered in marketing education, business communications, and information systems management.

See the *Graduate Catalog* or write to the Department of Business Information Systems and Education for further information.

Business Information Systems and Education Courses

100. Business Orientation. Orients freshmen and transfer students to College of Business programs, academic and student services, professional organizations, and career possibilities. (1F,W,Sp)

111. Beginning Typewriting/Keyboarding. For students with no previous keyboarding experience. Designed so student can touch type and learn basic concepts related to word processing. (3)

112. Introduction to Word Processing. Assumes ability to keyboard by touch at a minimum of 40 words a minute for five minutes. Emphasis on improving keyboarding skill to 60 words a minute and typing letters, tables, manuscripts, and other word processing applications. Prerequisites: BIS 111 or ability to key 40 wam, and BIS 140. (3)

SK 140. Microcomputer Applications in Business. Instruction in the use of microcomputers in business. Includes word and data processing applications. Prerequisite: ability to keyboard material at 25 wam required. (3F,W,Sp,Su)

141. Special Topics. Selected topics related to using computers in business. (1-3) ®

142. Word Processing Applications. Word processing software instruction designed for office applications. Prerequisite: BIS 140 or equivalent. (3)

155. Business Correspondence. Development and application of effective business writing skills. Primary emphasis given to business letters and memoranda as tools for effective written communication. Prerequisite: BIS 140. (3)

225. Introductory Internship. An introductory level experience in a career-related internship position approved by the cooperative internship office. One credit for every 75 hours of internship experience. Maximum 6 credits. (1-6) ®

230. Telecommunications and Information Technology in Business. Overview of telecommunications, advanced disk operating system (DOS) with and without windows, and the use of various utility programs to enhance microcomputer use and performance. Prerequisite: BIS 140. (3)

240. Desktop Publishing of Business Documents. Design, development, and evaluation of business documents using the technology of desktop publishing. Prerequisite: BIS 140. (3)

245. Spreadsheets and Databases for Business. Concepts related to integration of microcomputer spreadsheets and databases into business. Use of spreadsheets and databases to accomplish business operations. Prerequisite: BIS 140 or equivalent. (4)

246. Spreadsheets for Business. Provides concepts related to integration of microcomputer spreadsheets into business organizations. Use of spreadsheets to accomplish business operations. Prerequisite: BIS 140 or equivalent. (3)

247. Databases for Business. Provides concepts related to integration of microcomputer databases into business organizations. Use of databases to accomplish business operations. Prerequisite: BIS 140 or equivalent. (3)

252. Managing Word Processing Systems. Application of word processing concepts and equipment for production of business papers. Emphasizes the design and management of word processing systems. Prerequisite: BIS 142. (4)

255. Business Communication. The development and application of effective business writing skills. Primary emphasis given to the business report as a tool for effective written communication. Prerequisites: Engl 101 or 111, and Engl 200 or 201. (3)

260. Office Procedures. Finishing course which integrates office knowledge and skills. Applies administrative activities which are part of the office process. Prerequisites: BIS 155 or 255, and BIS 252. (3)

300. Principles of Business and Marketing Education. First course in sequence of professional requirements. Includes basic principles of business and marketing education, including history, curriculum designs, professionalism, and principles of vocational education. (3F)

303. Field-based Experience. Exploratory experience generally offered for sophomores; provides for early self-assessment of potential for success in teaching; students spend 40 hours in public schools. (1-2)

IO 305H. Information Technology and the Future. A critical examination of the impact of information technology on the world of the future. A humanistic look at where current trends may lead us. (3)

IO 306H. The World of Systems. An introduction to systems concepts and an understanding of how different types of systems are controlled and interact with their environment. (3)

310. Business Information Systems. Introduces business information systems concepts to include: systems' components, systems' life cycle, business information requirements, database concepts, and information systems' analysis, design, and implementation. Prerequisite: BIS 140. (3)

SS 314. Managing Personal Finances. The impact of the consumer movement on society and the individual, the use and abuse of money, and the major services available to the consumer. (3) ©

325. Discussions with Business Leaders. Examines new methods for improving U.S. competitiveness by attending the Partners Program seminar sessions and hosting visiting executives from top U.S. companies. Repeatable to a maximum of 6 credits. (1F,W,Sp,Su) ®

330. Database Management. Concepts and methods of defining, creating, and managing database systems. Principles of management of data resources to support effective information systems in organizations. Prerequisites: BIS 310 and one programming language. (3)

350. Spreadsheet and Database Projects for Business. Concepts related to integration of microcomputer spreadsheets and databases in the completion of projects for business. Business project solutions using spreadsheets and databases. Prerequisites: BIS 245; or BIS 246 and 247; or equivalent. (3)

355. Principles of Selling. Focuses on the selling process, including prospective and qualifying customers, planning and delivering the sales presentation, overcoming objections, and closing the sale. Lecture, discussion, and demonstration. (3) ©

410. Business Systems Analysis and Design. Introductory business systems analysis and design course stressing design of distributed business information systems. Both traditional forms driven methodology and computer systems design software will be used. Prerequisites: BIS 310; BIS 245, or BIS 246 and 247; and BIS 350. (4)

425. Advanced Internship. An advanced or middle-level experience in a career-related internship position approved by the cooperative internship office. One credit for 75 hours of internship experience. Maximum of 12 credits. (1-12F,W,Sp,Su) ®

435. Introduction to Training and Development Programs in Business. Introductory course in training and development. Examines various roles of the human resource manager in training domain. Students learn systems approach to developing and implementing training programs in business. (4)

450. Secondary Curriculum Seminar. Discusses planning, teaching procedures, adapting classroom practices to individual differences, testing, and evaluation during student teaching. To be taken concurrently with BIS 460. Prerequisite: admission to teacher education. (3)

455. Principles of International Business Communication. Culture-general and culture-specific study of business communication in the diverse world of international business from both theoretical and applied perspectives. (4)

460. Student Teaching in Secondary Schools. Prerequisites: admission to teacher education, Psy 366, ScEd 301, and Special Methods in major and/or minor subjects. (12)

485H. Senior Honors Seminar. Presentation of senior thesis project created in the 495H course. Focus is on scholarly approach, problem definition, and methodology. (1Sp)

495H. Senior Honors Thesis. Creative project that will then be written up as a Senior Thesis as required for an Honors Plan. (3-9F,W) ®

505. Object-Oriented Project Development. Application of the Object Model to software development. Object-based development environment used for project design, development, and maintenance. Prerequisites: BIS 310 and 350. (3)

510. Business Information Systems Development. Design and development of a complete, integrated microcomputer applications system to meet the information needs of a specific business situation. Prerequisites: BIS 245, or BIS 246 and 247; BIS 350. (4)

515. Decision Support Systems. Designed to prepare business information specialists. Role of the microcomputer in information management and developing familiarity with available microcomputer software which supports business decision systems. Prerequisites: BIS 140, 310; BIS 245, or BIS 246 and 247; Stat 230 or Psy 380; or equivalents. (3)

520. Local Area Network Management for Business. Application of networking concepts related to the management of local area networks. Includes topics related to repair, setup, management, and maintenance of local area networks. Prerequisites: BIS 310; BIS 245, or BIS 246 and 247. (3)

530. Internet Management for Business. Installation and setup of software to utilize Internet services. Services covered include: e-mail, ftp, gopher, telnet, world wide web, and Usenet News. Prerequisite: BIS 230. (3)

541. Managing Information Technology in Business. Introduces current technologies which impact upon managing business information. Participants will learn about equipment, applications, and management skills which lead to increased productivity. (3Sp,Su) ©

545 (d645).[1] Computerized Business Presentations. Designed to utilize computerized presentation capabilities. Participants will use computers to generate and deliver effective presentations. Prerequisites: BIS 245, or BIS 246 and 247. (3)

561. Business Education/Marketing Education Curricula and Student Organizations. Study of business and marketing education curriculum. Examines how to develop curricula, use the cooperative education method, and complete other supervisory and administrative tasks. (3)

566 (d666). The Adult Business Learner. Designed to help students develop an understanding of the adult business learner. Examines alternative methods of delivering adult business programs. (3F,Su)

570. Management of Global Information Systems. Management issues inherent in the global information systems function. Emphasis on elements that make global information systems management different from other organizational functions. (3)

572. Methods of Teaching Business and Marketing Education. Methods of teaching as applied to business and marketing education courses such as general business, business law, business principles, accounting, marketing, and merchandising. Prerequisites: Acct 201, 203, BA 350, and admission to teacher education. (3)

573. Methods of Teaching Keyboarding and Microcomputing. Psychological principles and methodology for teaching keyboarding, microcomputing, and computerized accounting. Includes microcomputer equipment, teaching laboratory needs, classroom management, and lesson planning. Prerequisites: BIS 112, 140, and admission to teacher education. (3)

595. Independent Readings. (1-5) ®

Graduate[2]

610. Business Information Systems Analysis. (3)

611. Workshop. (1-3) ®

612. Business Information Systems Design. (3)

615. Communications for Business. Prerequisite: BIS 255 or equivalent. (3)

620. Business Data Communication Systems. (3)

625. Business Internship. (1-6) ®

630. Database Management Systems. (3)

635. Designing and Managing Business Training Programs. (4)

640. Microcomputer Applications in Business. Prerequisite: BIS 140 or equivalent. (3)

641. Emerging Business Information Technologies. (3Sp,Su)

645 (d545). Computerized Business Presentations. (3)

650. Microcomputer Business Systems. Prerequisite: BIS 140 or equivalent and programming course. (3)

655. International Business Communication. (4)

660. Business Teaching Internship. (1-3) ®

662. The Business Curriculum. (3)

666 (d566). The Adult Business Learner. (3F,Su)

670. Information Systems Resource Management. (3)

672. Improvement of Instruction in Business. (3)

673. Improvement of Instruction in Typewriting and Business Microcomputing. (3)

676. Cooperative Programs in Business and Marketing Education. (3)

677. Competency-Based Instruction. (3)

681. Research and Proposal Writing. Repeatable once for credit. (3) ®

695. Independent Readings. (1-5) ®

697. Master's Paper. (1-9) ®

699. Continuing Graduate Advisement. (1-3) ®

725. Graduate Research Internship. (1-3) ®

733. Supervision Internship. (3-12) ®

***761. Critical Analysis of Current Issues.** (3) ®

770. Global Information Systems Management. (3)

781. Research Seminar. (1) ®

795. Independent Readings. (1-5) ®

797. Doctoral Dissertation. (1-18) ®

799. Continuing Graduate Advisement. (1-3) ®

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*Taught 1996-97.

**Taught 1997-98.

[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

Department of
Chemistry and Biochemistry
College of Science

Head: Professor Vernon D. Parker
Office in Maeser Laboratory 106, 797-1619

Associate Head: Professor Richard K. Olsen
Office in Maeser Laboratory 211, 797-1625

Professors Steven D. Aust, Stephen E. Bialkowski, Edward A. McCullough, Jr.; **Distinguished Professor Emeritus** R. Gaurth Hansen; **Professors Emeritus** William M. Moore, Grant Gill Smith, Jack T. Spence; **Adjunct Professor** Linda S. Powers; **Associate Professors** Ann E. Aust, David Farrelly, John L. Hubbard, Michael E. Wright; **Associate Professor Emeritus** Thomas M. Farley; **Assistant Professors** Danny J. Blubaugh, Robert S. Brown, Mitchell S. Chinn, Eric D. Edstrom, Scott A. Ensign, Richard C. Holz, Lance C. Seefeldt, Greg M. Swain; **Research Assistant Professor** Thomas A. Grover; **Adjunct Assistant Professor** James S. Dyer

Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA), Master of Science (MS), and Doctor of Philosophy (PhD) in Chemistry; MS and PhD in Biochemistry

Areas of specialization: Analytical Chemistry; Biochemistry; Inorganic Chemistry; Organic Chemistry; Physical Chemistry

Objectives

The Department of Chemistry and Biochemistry offers a variety of courses designed to prepare students for careers which utilize the sciences of chemistry and biochemistry, including teaching at all levels, positions of chemists in industry or government and, with further training in other disciplines, in law, medicine, and business. The program offered for the BS degree (professional chemistry option) is fully approved by the American Chemical Society. The department's courses also serve students from many other disciplines, both in strengthening their technical backgrounds and in building a base for life in a technological society.

General College of Science Requirements

Orientation Requirement. All students graduating from the College of Science are required to take the college orientation course: Sci 150, Science Orientation.

Written Communications Requirement. In addition to the University's written communication requirement, the college requires a junior level writing class. This requirement may be filled by completing either English 301 or 305.

Bachelor of Science Core Requirements. Students working toward the Bachelor of Science degree in any major within the College of Science must complete the following:

A. Math 220 and 221.

B. Either CS 160 or Stat 201.

C. One of the following sequences: (1) Biol 125 and either Biol 126 or Biol 127; (2) Chem 121, 122, and 124; (3) Geol 111 and 200; (4) Phyx 221 and 222.

Majors in Biology, Chemistry and Biochemistry, Geology, and Physics **cannot** satisfy requirement *C* by taking a sequence in their own discipline. Higher level courses than the ones listed in the three categories above may be substituted in some instances. Approval for any substitutions must be obtained in advance.

Note: The above Bachelor of Science requirements are **not** in effect for the Bachelor of Arts degree.

Department of Chemistry and Biochemistry Requirements

Departmental Admission Requirements. Admission requirements for the Department of Chemistry and Biochemistry are the same as those described for the University on pages 8-11. Students in good standing may apply for admission to the department.

No Chem prefix course may be applied toward graduation with any major in chemistry with an earned grade of less than *C-*. No Chem prefix course may be repeated more than one time to improve the grade to a *C-* or better. A student dropped from the chemistry program for failure to meet this standard may be readmitted only upon appeal to the Undergraduate Studies Committee.

Students majoring in chemistry may pursue either a **Bachelor of Science Degree,** which entails considerable specialization in chemistry or science, or a **Bachelor of Arts Degree** for those who desire a broader education in the liberal arts and sciences. There are five options for the BS degree, all requiring a common core of courses but allowing for differing emphasis in advanced work according to the interests and career objectives of the student. Three of the options will meet the requirements for certification as chemical professionals by the American Chemical Society. These emphases include **chemistry, biochemistry,** or **chemistry education.** Other options include a **life science** emphasis, and an alternate **chemistry teaching** major.

The following core courses are required for all bachelor's degrees[1]: general chemistry (Chem 121, 122, 123, 124, 160), physical chemistry (Chem 306, 307, 309, 310), organic chemistry (Chem 231, 232, 233, 234, 235, 236), inorganic chemistry (Chem 351, 352), biochemistry (Chem 370), analytical chemistry (Chem 360, 361), and seminar (Chem 499). Included as prerequisites for some of the courses are Phyx 221, 222, and Math 220, 221, 222, and 320. Three upper-division credits beyond Math 320 are required, with Math 321 highly recommended.

Additional requirements for the **professional chemistry BS option** are Chem 308, 311, 533, 552, 564, and 565, plus 6 additional credits in appropriate advanced courses such as Chemistry courses numbered 600 and above; Phyx 341, 342, 411, 412, 413, 461, 462, 463, 601; Math 541, 542, 543, 561, 562, 563; Stat 301, 502, 505, 510; or other courses approved by the

department. For students planning advanced study in analytical or physical chemistry, Phyx 411 is highly recommended.

The **BS degree with biochemistry emphasis** requires the following additional courses: Chem 308, 564, 565, 571, 572, 573, and Biol 125, plus 6 additional credits of advanced courses.[1]

For the **chemistry education emphasis** the following courses should be added to the core: Chem 308 or 564; one of Chem 311, 371, 533, 565; and two of Biol 125, Geol 111, and Phyx 200. These students must also complete teacher certification requirements (see detailed major requirement sheet or Secondary Education listing).

For the **BS life science option,** additional courses required beyond the core are: Biol 125; Biol 127 or Phyl 130; Biol 126 or 319 or Micb 301; Chem 308, 311, and 371; and 5 additional credits in approved courses numbered 300 or above in chemistry, biology, mathematics, or physics. (Neither Biol 310 or 370 is acceptable for this requirement.)

Those pursuing the BA degree must complete two years of courses in a foreign language in addition to the core courses.

For suggested quarterly schedule for BS and BA degrees, see requirement sheet available from the department.

Chemistry Minor. Students must complete at least 15 credits of chemistry coursework (chemistry courses numbered 200 or above) in addition to Chem 121, 122, 123, 124, and 160, or their equivalent, in order to qualify for an approved minor in chemistry. The following courses are recommended: Chem 231, 232, 233, 234, 235, 236, 351, 352, 360, 361, 370, and 371.

Teaching Major and Minor. A teaching major or minor in chemistry is available through the Department of Chemistry and Biochemistry and the Department of Secondary Education. Students seeking this degree should see the detailed requirement sheet available from these departments.

An application for admission to teacher education should ordinarily be completed before the junior year (see College of Education for requirements). Approval is a prerequisite to teacher certification candidacy and to enrollment in education and psychology courses.

Honors. There is also an Honors Plan for students desiring a BS degree "with Honors" in Chemistry. For details, students should contact their academic adviser.

Graduate Study

Combined BS-MS Degree (Five-year Program). A good student with a minimum GPA of 3.0 at the third year, who is interested in the five-year BS-MS degree in chemistry or biochemistry, should consult with the Department of Chemistry and Biochemistry.

For further information regarding admission standards, entrance requirements, and graduation requirements for MS and PhD degrees in chemistry or biochemistry, see the *Graduate Catalog*.

[1]Some exceptions apply to the Chemistry Teaching major. See detailed major requirement sheet available in the Chemistry and Biochemistry office.

Chemistry Courses

PS 101. Introduction to Chemistry. A lecture-demonstration course designed primarily for students of nursing, liberal arts, and others whose major field does not require further chemistry. (5F,W,Sp,Su) ©

PS 111. General Chemistry. For nonscience majors. Prerequisite: one unit of high school or college algebra. Four lectures and one recitation. (5F,W,Su)

PS 121. Principles of Chemistry. For science and engineering majors and others who will take additional chemistry courses. Prerequisite: completion of or concurrent enrollment in Math 105 or high school equivalent. Some previous chemistry in high school or college is highly recommended. Four lectures and one recitation. (5F,W)

PS 122. Principles of Chemistry. Continuation of 121. Three lectures, one recitation. Must be taken concurrently with Chem 124 unless permission is received from instructor. (4W,Sp)

123. Principles of Chemistry. Continuation of 122. (3F,Sp)

PS 124. Chemical Principles Laboratory. Must be taken concurrently with Chem 122. One three-hour laboratory per week. Prerequisite: Chem 121. (1W,Sp)

PS 141. Elementary Organic Chemistry. An introduction to organic chemistry. Prerequisite: Chem 111. (4W,Sp,Su)

PS 142. Molecules and Life. Designed for nonscience majors, this course covers topics relevant to our everyday life. Topics include enzymes, vitamins, hormones, and the molecular basis of disease. (4Sp)

PS 144. General Chemistry Laboratory. A one-quarter laboratory course including basic as well as sophisticated chemical principles, techniques, and instrumentation. Prerequisite: previous or concurrent registration in Chem 141. (2Sp)

160. Quantitative Analysis I. Normally taken concurrently with Chem 123. Introduction to principles and practice of quantitative laboratory measurements. Two three-hour lecture/laboratories per week. Prerequisite: Chem 124. (2F,Sp)

195. Glass Blowing. (1)

231, 232, 233. Organic Chemistry. A three-quarter sequence covering the physical properties, nomenclature, reactivity, and biological relevance of organic and bioorganic molecules. Prerequisite: Chem 123. (3F) (3W) (3Sp)

234. Organic Chemistry Laboratory. Introduction to modern laboratory techniques and methods of organic chemistry. Should be taken concurrently with Chem 231. Prerequisites: Chem 123, 160. (1F)

235. Organic Chemistry Laboratory. Laboratory exploring the use of organic reactions and modern spectroscopic techniques in organic chemistry. Should be taken concurrently with Chem 232. Prerequisite: Chem 234. (1W)

236. Organic Qualitative Analysis Laboratory. Laboratory focused on determining the structure of organic compounds using modern spectroscopic and analytical techniques. Should be taken concurrently with Chem 233. Prerequisite: Chem 235. (1-2Sp)

306, 307, 308. Physical Chemistry. Quantitative methods for solving problems in chemical thermodynamics, phase change, electrochemistry, reaction kinetics, quantum theory, and molecular structure. Prerequisites: Chem 123, 160, Phyx 222, Math 320. (3F) (3W) (3Sp)

309, 310, 311. Experimental Physical Chemistry. Work correlated with Chem 306, 307, 308. (2F) (2W) (2Sp)

351. Intermediate Inorganic Chemistry. Explores the various classes of inorganic compounds, emphasizing descriptive aspects, synthesis, reactions, identification, and physical properties. Prerequisite: Chem 123. (3Sp)

352. Inorganic Chemistry Laboratory. Utilizes qualitative inorganic analysis, synthesis, and the use of spectroscopic tools to explore the descriptive chemistry of inorganic materials. (1Sp)

360. Quantitative Analysis II. Continuation of Chem 160. Basic theory and laboratory practice in analytical chemistry, including introduction to multiple equilibria and chemical separation methods. Prerequisites: Chem 123, 160, Math 105. (3F)

361. Quantitative Analysis II Laboratory. Designed to accompany Chem 360. Two three-hour laboratories per week. Must be taken concurrently with Chem 360. Prerequisites: Chem 123, 160, and Math 105. (2F)

370. Intermediate Biochemistry. A brief survey of the chemistry of biologically important compounds and their role in animal and plant metabolism. Prerequisites: Chem 123 and either Chem 141 or 232 or equivalent. (4Sp)

371. Biochemistry Laboratory. A laboratory course designed to be taken concurrently with Chem 370. One three-hour lab per week. (1Sp)

425. Cooperative Experience. Planned work experience outside the University. Specific experience must receive prior approval for credit to be earned. Consult adviser or department head for details. (1-3F,W,Sp,Su) ®

480. Research Problems. (1-3F,W,Sp,Su) ®

499. Seminar. (1Sp) ®

516. Methods in Biotechnology: Cell Culture. Laboratory-intensive course in basic and applied methods of culturing cells (mammalian, insect, plant) and methods of fusing and transforming cells. Prerequisites: Biol 125 or ADVS 316 or equivalent, or permission of instructor. (3W)

524. Methods in Biotechnology: Protein Purification Techniques. Laboratory-oriented course designed to provide basic knowledge in protein purification, analysis, and its scale up. Prerequisites: Chem 370 or ADVS 316, or permission of instructor. (3Sp)

526. Methods in Biotechnology: Molecular Cloning. Laboratory-oriented course in molecular cloning techniques such as DNA cloning, genetic probes, PCR, DNA sequencing. Prerequisites: Chem 370 or Biol 319 and Micb 301 or equivalent, ADVS 316, or permission of instructor. (3F)

533. Advanced Synthesis Laboratory. A laboratory course in practical synthetic methods requiring advanced technique; inert atmosphere, vacuum line, tube furnace, etc. Prerequisites: Chem 235, 352. Chem 311 concurrently. (2Sp)

552. Advanced Inorganic Chemistry. Study of the elements and their compounds. Structure/bonding/properties relationships and stereochemistry of inorganic compounds. Prerequisites: Chem 306 and 351. (3F)

564. Instrumental Analysis. Theory and application of physiochemical methods of analysis. Selected electrochemical and optical methods. Prerequisites: Chem 308, 360, 361. (3W)

565. Instrumental Analysis Laboratory. Laboratory course to accompany Chem 564. Two four-hour labs per week. Prerequisites: Chem 308, 361. (2W)

570. General Biochemistry. General biochemistry for science majors, including proteins, enzymes, and catalysis. Recommended course for pregraduate and preprofessional school students. Prerequisites: Chem 123, 233. (3F)

571. General Biochemistry. General biochemistry for science majors, including metabolism and bioenergetics. Recommended for pregraduate and preprofessional school students. Prerequisite: Chem 570. (3W)

572. General Biochemistry. General biochemistry for science majors. Topics include DNA, RNA, and molecular biology. Recommended for pregraduate and preprofessional school students. Prerequisite: Chem 571. (3Sp)

573. General Biochemistry Laboratory. General biochemistry laboratory, to be taken concurrently with Chem 572. Corequisite: Chem 572. (1Sp)

Graduate[1]

600. Chemical Kinetics. (3F)

601. Quantum Chemistry. (3W)

602. Molecular Spectroscopy and Structure. (3Sp)

625, 626, 627. Advanced Organic Chemistry. (3F) (3W) (3Sp)

629 (f529)[2]. Plant Molecular Biology. (4F)

649. Chemical Applications of Group Theory. (1F)

650. Reactivity and Mechanisms in Inorganic Chemistry. (3F)

***651. Coordination Chemistry.** (3F)

662. Analytical Chemistry. (3Sp)

670, 671, 672. Advanced Biochemistry. (3F) (3W) (3Sp)

689. Molecular Biology Seminar. (1F,W,Sp,Su) ®

691. Special Problems in Chemistry and Biochemistry. (1-6F,W,Sp,Su) ®

697. Thesis Research. (1-15F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-3) ®

***701. Chemical Thermodynamics.** (3F)

***702. Statistical Mechanics.** (3Sp)

***705. Atmospheric Chemistry and Photochemistry.** (3W)

733. Special Topics in Organic Chemistry (Topic). (3) ®

753. Special Topics in Inorganic Chemistry (Topic). (2-3)

***760. Analytical Spectroscopy.** (3Sp)

***761. Analytical Separations.** (3W)

***762. Electrochemistry.** (3W)

764. Special Topics in Analytical Chemistry (Topic). (3) ®

777. Special Topics in Biochemistry (Topic). (2-3F) ®

780. Seminar. (1) ®

797. Dissertation Research. (1-15) ®

799. Continuing Graduate Advisement. (1-3) ®

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[1]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

[2]Parenthetical numbers preceded by an *f* are the *former* course numbers.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

*Taught alternate years (see department).

Department of

Civil and Environmental Engineering

College of Engineering

Head: Professor Loren R. Anderson
Office in Engineering Laboratory 211, 797-2932

Professors A. Bruce Bishop (Dean), David S. Bowles, Vance T. Christiansen, R. Ryan Dupont, William J. Grenney, Daniel H. Hoggan, Trevor C. Hughes, L. Douglas James, Roland W. Jeppson, Upmanu Lall, William J. Rahmeyer, Ronald C. Sims, J. Paul Tullis (Sr. Research Scientist, USU Research Foundation), Muzz Yener; **Professors Emeriti** Jay M. Bagley, Winfred O. Carter, Calvin G. Clyde, William A. Cordon, Irving S. Dunn, Gordon H. Flammer, Joel E. Fletcher, C. Earl Israelsen, Norman B. Jones, Fred W. Kiefer, Jr., Elliot Rich, J. Paul Riley, Reynold K. Watkins; **Adjunct Professors** Ibrahim M. Elassiouti, Jeffrey R. Keaton, Norman E. Stauffer, Jr., Daniel A. Stone; **Associate Professors** Joseph A. Caliendo, William J. Doucette, Thomas B. Hardy, Jagath J. Kaluarachchi, Marian W. Kemblowski, Audrey D. Levine, Michael J. McFarland, Wende A. O'Neill, Prianka N. Seneviratne, David K. Stevens, J. Derle Thorpe, Gilberto E. Urroz, Kevin C. Womack; **Research Associate Professor** Darwin L. Sorensen; **Adjunct Associate Professors** David G. Blake, Witold F. Krajewski, Eva C. Nieminski, Lakshman L. Ratnayake; **Assistant Professors** Marvin W. Halling, Daniel P. Smith, David G. Tarboton; **Adjunct Assistant Professors** Dan F. Adkins, Roger D. Hansen, Lee Hosin, William R. James, Mufeed M. Odeh; **Research Assistant Professors** Joan E. McLean (UWRL), Judith L. Sims (UWRL); **Affiliate Faculty** Robert W. Gunderson, Robert W. Hill, John E. Keith, Jeffrey J. McDonnell, Michael P. O'Neill, Richard C. Peralta, Wynn R. Walker

Degrees offered: Bachelor of Science (BS) in Civil Engineering; BS in Environmental Engineering; Master of Science (MS), Master of Engineering (ME), and Doctor of Philosophy (PhD) in Civil and Environmental Engineering; Civil Engineer (CE)

Objectives

Civil and Environmental Engineering is concerned with planning, designing, constructing, and operating various physical works; developing and utilizing natural resources in an environmentally sound manner; providing the infrastructure which supports the highest quality of life in the history of the world; and protecting public health and renovating impacted terrestrial and aquatic systems from the mismanagement of toxic and hazardous wastes. In order to prepare students to meet these challenges facing our global society, the Department of Civil and Environmental Engineering offers Bachelor of Science degrees in Civil Engineering and in Environmental Engineering. The goal of each program is to take bright and creative students and increase their technical knowledge, problem solving skills, creative thinking, ability to learn, self-confidence, professional ethics, social responsibility, ability to work as a team, and global perspective. The Civil Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET).

The curriculum for both the Civil Engineering program and the Environmental Engineering program provides an educational experience that integrates the humanities and social sciences and the basic fundamentals of mathematics, science, and engineering science with appropriate laboratory and engineering design activities. This program of study prepares students to begin practicing their profession. Civil and Environmental Engineering is a broad and diversified profession, offering a variety of career opportunities in small towns and giant metropolises. Civil and environmental engineers may be involved in office jobs dealing with clients or engaged in planning, design, or project management. They may also be involved in field work, gathering information at project sites, or managing construction.

Requirements

Admission Requirements. Admission requirements for the Department of Civil and Environmental Engineering are the same as those described for the University on pages 8-11. Students in good standing may apply for admission to the department. In addition, students must maintain the academic requirements outlined for the College of Engineering on page 47.

Bachelor of Science Degrees. The Department of Civil and Environmental Engineering offers two Bachelor of Science degrees: one in Civil Engineering and one in Environmental Engineering. The four-year programs leading to these two degrees are listed below. During the first two years, students are in a pre-engineering program. Students must successfully complete the pre-engineering program or, in the case of transfer students, substantially equivalent coursework at another institution before they are accepted in the professional program. Transfer students may apply for permission to take upper-division courses in cases where postponement of said courses will prolong the student's time to graduate.

Design is a cornerstone of engineering that requires creative thinking, technical knowledge, the ability to organize and solve complex problems, and teamwork. Engineering design activities begin during the first two years and progress in-depth as each student's proficiency increases. These design activities culminate in a major senior design course which integrates past engineering coursework into a focused, realistic design project. An important feature of the senior design experience is that students work in teams to complete the project.

The student who is majoring in or planning to major in Civil Engineering or Environmental Engineering needs to be aware of the College of Engineering requirements concerning admission to the college, pre-engineering program, admission to professional engineering programs, general education, and other academic requirements. Additional information concerning these items is given in the College of Engineering write-up on pages 46-48. It is the responsibility of the student to be aware of these rules and regulations. **Passing the Fundamentals of Engineering Exam is required for graduation.**

Also, all undergraduate CEE students will be required to have an HP-48G or GX series calculator.

Undergraduate Study—Civil Engineering

Preengineering Program (freshman and sophomore years): Engr 103, 187, 200, 202, 204; Chem 121, 122, 124; CEE 188, 205, 224, 287; ECE 270; Econ 200; Engl 101, 201; Geol 111; ITE 227; Math 220, 221, 222, 320, 321, 322; Phyx 221, 222, 223; General Education courses.

Professional Engineering Program (junior and senior years): Engr 330; CEE 303, 305, 306, 308, 309, 321, 328, 343, 350, 351, 361, 364 or 365, 387, 388, 420, 425, 430, 487, 512, 588; General Education courses. Technical electives (24 credits) chosen from: CEE 364 or 365, 431, 504, 505, 506, 507, 508, 513, 519, 522, 523, 532, 538, 543, 556, 561, 568, 574, 575, 576, 579, 582, 583, 584, 587; BIE 543; ECE 271; MAE 508.

Undergraduate Study—Environmental Engineering

Preengineering Program (freshman and sophomore years): Engr 103, 187, 200, 202, 330; Chem 121, 122, 124, 141; CEE 188, 224, 287, 361, 362, 387; Biol 125; Econ 200; Engl 101, 201; ITE 227; Math 220, 221, 222, 320, 321, 322; Phyx 221, 222; General Education courses.

Professional Engineering Program (junior and senior years): Engr 204; CEE 303, 343, 350, 351, 364, 365, 367, 369, 370, 388, 420, 487, 543, 561, 573, 578, 581, 588; Soil 358; PubH 510 or Phyx 505; General Education courses. Technical electives (18 credits) chosen to develop an option in Public Health/Industrial Hygiene; Solid and Hazardous Waste Management; Natural Systems Engineering; Air Pollution Management; and Water and Waste Management/Bioengineering. A list of the specific courses that can be used to develop an option can be obtained from the Civil and Environmental Engineering Department.

For more information about Bachelor of Science requirements and the sequence in which courses should be taken, see major requirement sheet, available from the Civil and Environmental Engineering Department.

Departmental honors can be earned by taking 20 credits of upper-division engineering courses. Students should work with the department in selecting appropriate courses.

Graduate Study

The CEE Department offers the Master of Engineering, Master of Science, Civil Engineer, and Doctor of Philosophy degrees. See *Graduate Catalog* for specialty programs.

Excellent interdepartmental and intercollege cooperation, along with the large, outstanding staff of the department, most of whom have PhD degrees from prominent universities and are registered professional engineers, make for an extensive and varied graduate program. Research conducted through the Utah Transportation Center, Utah Water Research Laboratory, Institute for Natural Systems Engineering, and the Engineering Experiment Station enhances these programs and provides financial assistance to outstanding graduate students. Graduate specialties include environmental engineering, fluid mechanics, geotechnical engineering, hydraulics, hydrology, structural mechanics, transportation, water quality, water resources, and groundwater.

Civil and Environmental Engineering Courses

188. Engineering Orientation and Computer Applications. Orients students to College of Engineering programs, academic advising, student services, professional societies, and engineering careers. Laboratory activities emphasize writing and computer applications. Prerequisites: Math 106 and keyboarding at 25 wam. (1W)

205. Dynamics Laboratory. Planar kinetics, supervised problem-solving, and demonstrations. To be taken concurrently with Engr 202. Two-hour period. (1W,Sp)

224. Engineering Surveying. Principles and methods of engineering surveying including terminology, computations, areas, volumes, field astronomy, computer analysis, and the use of surveying instruments. Two lectures, two labs, one recitation. Prerequisite: trigonometry. (4Sp,Su)

225. Cooperative Practice. A planned work experience in industry. Detailed program must have prior approval. Written report is required. (3-9F,W,Sp,Su) ®

287. Sophomore Seminar. Supervised discussion and review of problems encountered by professional engineers. (1W) ®

303. Uncertainty in Engineering Analysis. Principles of probability and statistics are applied specifically to problems in civil and environmental engineering, including transportation, water quality, waste treatment, hydrology, and materials. (3F)

305. Mechanics of Solids. Stress, strain, and deflection due to flexure and shear. Combined stresses, instability, effect of repeated and dynamic loadings. Prerequisite: Engr 204. (3F,W,Sp)

306. Structural Mechanics. Analysis of statically determinate and indeterminate structures. Prerequisites: CEE 303 and 305, or instructor's consent. (3W)

308. Structural Concrete Design. Fundamental principles and practice of the design of concrete and masonry structural elements. Prerequisite: CEE 306. (3Sp)

309. Structural Testing Laboratory. Laboratory testing and analysis of steel, concrete, timber, and masonry structural elements. (1Sp)

321. Introduction to Transportation Engineering. Introduction to basic concepts in transportation engineering with multi-modal emphasis. Prerequisite: CEE 303. (3Sp)

328. Engineering Materials. Influence of atomic arrangement, bonding, and crystalline structure on the properties of construction materials. The properties, requirements, and uses of engineering materials in modern construction. Two lectures, lab arranged. (3W)

343. Engineering Hydrology. The hydrologic cycle, including weather elements and climate, precipitation, evaporation, transpiration, infiltration, groundwater, runoff, and methods of collection of hydrologic data. Three lectures, one lab. Prerequisites: CEE 303, 350, and scientific computer programming capability or instructor's consent. (4F,Sp)

350, 351. Engineering Fluid Mechanics. Fluid properties, hydrostatics, fluid dynamics similitude, energy and momentum principles, and flow measurements. Prerequisites: Math 322, Engr 103 and 202. CEE 350 must be completed prior to taking CEE 351. (3F,Sp) (4W)

361. Introduction to Environmental Engineering. Concepts and principles of natural science applied to engineering solutions of environmental problems. Applications in the aquatic, atmospheric, and terrestrial environments are explored. Prerequisites: Chem 122, Math 221. (3F)

362. Environmental Laboratory. Environmental systems, reactors, and reactor kinetics using computer simulation and laboratory exercises. Prerequisite: CEE 361. (3Sp)

364. Water Supply and Treatment. Application of physical, chemical, biological, and hydraulic principles to water supply and treatment for municipal and industrial uses. Prerequisites: CEE 351 concurrent, CEE 361, 362. (3W)

365. Wastewater Treatment Processes. Application of physical, chemical, biological, and hydraulic principles to the treatment of municipal and industrial wastewater. Prerequisites: CEE 351, 361, 362. (3Sp)

367. Transport Phenomena in Bio-Environmental Systems. A core course in both biological and environmental engineering. Student develops a detailed understanding of the principles, concepts, modes, and methods of calculating heat and mass transfer. Emphasis given to contaminants and nutrient flux, along with their state transformations in order for the biological or environmental engineer to evaluate options for production, clean-up, and control of bio-environmental systems. Prerequisites: Engr 330; CEE 350, 351. (3Sp)

369. Environmental Systems Engineering. Political, legal, and institutional frameworks under which existing assessment methods for physical, chemical, and biological impacts of altered flow regimes are addressed. Conceptual introductions to existing multidisciplinary assessments methods for physical, chemical, and biological elements. (3W)

370. Environmental Management and Regulation. Multimedia environmental quality management based primarily on current federal environmental regulations. (3F)

387. Technical Writing in Civil Engineering. Supervised discussion and review of problems encountered by professional engineers. Emphasis on communication skills. (2F)

388. Engineering Report Writing. Designing, structuring, and writing technical reports in engineering. (1W)

420. Engineering Economics. Applications of the mathematics of finance to engineering decision making. Prerequisite: Econ 200 or instructor's consent. (3F)

425. Legal Aspects of Engineering. Synopsis of the law of contracts. Writing of engineering specifications. Engineering ethics. (3Sp)

430. Soil Mechanics. Elementary physics of soil as applied to engineering problems. Moisture, plasticity, and capillary relationships. Percolation and the design of earth structures and foundations. Two lectures, one lab. Prerequisites: CEE 305, 350. (3F)

431. Soil Engineering. Application of engineering soil mechanics and structural theory to the design of foundations, dams, highways, and other engineering problems. Prerequisite: CEE 430. (3W)

487. Senior Seminar. Supervised discussion and review of problems encountered by professional engineers. (1F,Sp) ®

493. Independent Study. A laboratory design or a research project on a problem selected by the student. It requires a review of literature, preparation of a proposal which describes the project, and the completion of a design or research and the preparation of a report. (1-3) ®

497. Honors Studies. Advanced work for qualified students. Initiated by the student and may consist of a special individual project under the direction of a faculty member, or of advanced study in connection with an established departmental course. Prerequisite: a satisfactory grade point average, recommendation of instructor, and approval of the College of Engineering Honors Committee. (1-3)

504. Structural Matrix Analysis. Matrix procedures for statically determinate and indeterminate trusses, beams, and frames; energy theorems; stiffness and flexibility methods; computer applications. Prerequisite: CEE 306. (4F)

505. Design of Concrete Structures. Reinforced and prestressed concrete structures, analysis and design; building bridges. Prerequisite: CEE 308. (3F)

506. Design of Masonry and Wood Structures. Design of masonry and timber/wood structures. One-half quarter on each topic. Prerequisite: CEE 308. (3W)

507. Design of Steel Structures. Buildings, bridges, framework design. Design project. Prerequisite: CEE 308. (3W)

508 (d610).[1] Numerical Methods in Elasticity. Elasticity theory; stress and strain analysis; failure theories; yield criteria; flex and torsion theories for solids and thin-walled members; energy methods; introduction to numerical methods; computer implementations. Prerequisite: CEE 305. (3F)

512 (d603). Finite Element Methods in Civil Engineering. Introduction to finite element analysis, covering applications in solid and fluid mechanics using variational and Galerkin techniques; linear, quadratic elements; natural coordinates; computer implementation. Prerequisite: CEE 305. (3W)

513 (d613). Structural Dynamics (Earthquake). Analytical and engineering methods of evaluating the response of structural systems to earthquake-induced motion. Current and anticipated building code requirements. Prerequisite: CEE 306. (3Sp)

518 (d618). Mechanics of Composite Structures. Behavior of composite structures including structural applications, manufacturing methods, joining and fastening, macro mechanical behavior, and analysis using computer techniques. Prerequisite: CEE 305. (3W)

519 (d619). Geographic Information Systems for Civil Engineers. Introduction to GIS concepts addressing data structures, spatial entities, and queries. Topics include location referencing methods, data collection techniques, current applications, institutional and organizational issues. (3Sp)

522 (d622). Traffic Engineering. Topics covered include characteristics, measurements, and analysis of volume, speed, density, and travel time; capacity and level of service analysis; signalization and traffic control devices. (3F)

523 (d623). Geometric Design of Highways. Topics include survey techniques, principles of highway location, vehicle operating characteristics, horizontal and vertical alignment, intersection design, and the use of computers in geometric design. (3W)

524 (d624). Transportation Planning. Urban and regional transportation planning process, data collection and analysis, travel demand modeling, land use, transportation interaction, computer applications. (3W)

525. Environmental Engineering Cooperative Practice. Applied environmental employment with primary focus of work experience related to one of the environmental engineering specialty areas. Prerequisites: Senior-level standing and permission of instructor. (3F,W,Sp,Su)

532. Foundations Analysis and Design. Engineering properties of soil and their effect on the design of footings, pile foundations, cofferdams, caissons, mat foundations, and retaining walls. (3Sp)

538 (d638). Earthquake Engineering—Geotechnical. Vibration theory, wave propagation, characteristics of earthquakes, influence of soils on ground shaking, prediction of ground motion, liquefaction, stability of dams, lateral soil pressure. Prerequisite: CEE 431. (3Sp)

543. Groundwater Engineering. Analytical techniques for evaluating groundwater flow, quality, and yield. Aquifer properties, storage, movement recharge, and withdrawal. Prerequisite: CEE 343. (3F)

549 (f649). Small Watershed Hydrology. A detailed exploration of the concepts of small watershed hydrology. Course material will concentrate on recent research findings for examining key hydrological processes. (3Sp)

556 (d656). Sedimentation Engineering. Sedimentation problems, transport mechanics, measurement techniques, sources, yields, control methods, economic and legal aspects. Prerequisite: CEE 351. (3Sp)

561 (d660). Water Quality Analysis. Methods of physical, chemical, and biological analysis of water and wastewater; underlying principles and limitations of test methods; statistical significance of data. Two lectures, two labs. Prerequisites: Chem 122, 124, CEE 364, 365, 388. (4F)

****562 (d672). Chemistry of Aquatic Systems.** Emphasis on the chemical processes occurring in natural environments. Principles of physical chemistry applied to problems involving the composition of natural waters and man's influence on these systems. (3Sp)

***568. Soil Based Hazardous Waste Management.** Engineering management of hazardous wastes present in the vadose zone including extraction, containment, and destruction technologies. Aspects include engineering characterization, problem definition, treatment, and monitoring. Prerequisites: Chem 122, 124, 141, Soil 358, CEE 362. (3Sp)

569 (d669). Water Resources Engineering. Synthesis of hydraulics, hydrology, and economics of water resource systems. Prerequisites: basic fluid mechanics or CEE 350; hydrology or CEE 343; and engineering economics or CEE 420. (3F)

573 (d673). Analysis and Behavior of Environmental Contaminants. Techniques used to analyze organic compounds in environmental samples will be presented. Extraction concentration, clean-up, and instrumentation techniques will be emphasized. Modeling the environmental fate and behavior of these compounds will also be discussed. Prerequisites: Chem 122, 141. (3W)

574 (d674). Applied Fluid Mechanics. Hydraulic and economic design of piping and open channel systems, including transitions and controls. Introduction to gas dynamics, lift and drag, and potential fluid flows. Prerequisites: CEE 350, 351 and proficiency in a high-level computer programming language. (3F)

575 (d675). Hydraulic Design. Design and operation of pipelines, economic analysis, pipe material and pipe pressure class, pump hydraulics and selection, flow control valves, cavitation analysis and design. Prerequisites: CEE 350, 351, 574/674. (3W)

576 (d676). Hydraulic Transients. Unsteady flow in closed conduits, transient analysis of water hammer caused by operating pipelines, valves, pumps, and turbines. Prerequisite: CEE 351 or MAE 355. (3Sp)

578 (d663). Solid and Hazardous Waste Management. Nature and scope of the solid waste disposal problem, the general state of the art, and management solutions based on social, economic, and technical considerations. Prerequisite: instructor's consent. (3Sp)

579. Accident and Emergency Management. Causes and impacts of accidental spills, fires, and explosions. Evaluation of safety/management practices and design considerations that can reduce potential accidents and their impacts. (3F)

581. Biochemical Engineering. Fundamentals of bioreactor design and bioengineering. Emphasis on mathematical models of microbial and enzymatic processes in environmental and industrial biotechnology. Prerequisites: CEE 365; and Micb 111 and 112, or Biol 125. (3W)

582. Biomass Processing. Introduction to the use of renewable resources for energy production and waste management. Prerequisites: Micb 111 and 112, or Biol 125; BIE/CEE 367. (3Sp)

583. Land Treatment of Wastes. Engineering management of the upper part of the vadose zone for treatment and ultimate disposal of nonhazardous wastes, including industrial, agricultural, and domestic wastes. Prerequisites: CEE 364 and 543. (3W)

584. Agricultural Waste Management Systems. Evaluation and design of engineering treatment systems for the management of agricultural wastes, utilization of aerobic and anaerobic systems, ponds and land application facilities for agricultural waste management and control. Prerequisites: CEE 350, 351, and BIE/CEE 367. (3Sp)

585. Water Quality Modeling. Engineering applications of water quality models for wasteland allocation, trophic analysis of lakes and reservoirs, point and nonpoint source discharges, and assessment of engineering controls to meet water quality objectives. Prerequisites: CEE 343, 362, 367. (3Sp)

***586 (d662). Air Quality Management.** Classifications of air pollutants and their sources, air quality standards, atmospheric sampling and analysis, technical approaches to control, regulatory measures, and selected topics in meteorological and biological effects. Prerequisite: instructor's consent. (3W)

****587 (d687). Hazardous Waste Incineration.** Introduction to thermal treatment of hazardous wastes through study and application of thermochemical principles for high temperature combustion of liquid and solid wastes. Prerequisites: Engr 330; CEE 350, 351. (3W)

588. Civil and Environmental Engineering Design Project. Major design experience that builds upon the fundamental concepts of basic sciences, engineering sciences, engineering design, and communication skills. (4W)

590. Cooperative Practice. A planned work experience in industry. Detailed program must have prior approval. Written report is required. (3-9) ®

596 (d696). Management of Regulated Rivers. Applications of existing multidisciplinary assessment methods for physical, chemical, and biological elements affected by water resource systems are applied, with an emphasis on integration of component study results for decision making. Prerequisites: CEE 351, 369, or permission of instructor. (3Sp)

Graduate[2]

601. Finite Element Methods in Structural Mechanics. (3)

603 (d512). Finite Element Methods in Civil Engineering. (3F)

606. Limit Analysis of Structures. (3F)

608. Structural Stability. (3F)

609. Similitude. (3F)

610 (d508). Numerical Methods in Elasticity. (3F)

613 (d513). Structural Dynamics (Earthquake). (3Sp)

614. Structural Optimization. (3Sp)

618 (d518). Mechanics of Composite Structures. (3W)

619 (d519). Geographic Information Systems for Civil Engineers. (3)

620. Pavement Design. (3)

621. Transportation Systems Analysis. (3)

622 (d522). Traffic Engineering. (3F)

623 (d523). Geometric Design of Highways. (3W)

624 (d524). Transportation Planning. (3)

625. Transportation Safety. (3)

626. Urban Mass Transportation. (3)

627. Traffic Flow Theory. (3)

630. Earth and Rock Fill Dams. (3)

631. Environmental Geotechnics. (3)

632. Deep Foundations. (3)

633. Consolidation Theory and Soil Improvement. (3)

634. Soil Mechanics Laboratory. (3)

635. Retaining Structures. (3)

636. Shear Strength and Slope Stability. (3)

637. Buried Structures. (3F)

638 (d538). Earthquake Engineering—Geotechnical. (3Sp)

640. Physical Hydrology. (4F)

641. Surface Runoff Hydrology. (3)

642. Engineering Risk and Reliability. (3)

643. Groundwater Hydrology. (3F)

****644. Groundwater Problem Solving.** (3)

645. Hydroclimatology. (3)

646. Hydrologic Time Series Analysis. (3)

647. Groundwater Modeling. (3Sp)

648. Subsurface Contaminant Transport. (3W)

650. Numerical Methods in Engineering. (3W)

653. Steady and Unsteady Hydraulic Modeling. (3Sp)

655. Open Channel Flow. (4F)

656 (d556). Sedimentation Engineering. (3Sp)

****657 (f757). Potential Fluid Flow.** (3W)

658. Fluid Mechanics. (4F)

660 (d561). Water Quality Analysis. (4F)

661. Environmental Management and Regulation. (3F)

***662 (d586). Air Quality Management.** (3W)

663 (d578). Solid and Hazardous Waste Management. (3Sp)

664, 665, 666. Water and Wastewater Treatment. (3F) (4W) (4Sp)

667. Industrial Wastewaters. (3Sp)

***668. Soil Based Hazardous Waste Management.** (3Sp)

669 (d569). Water Resources Engineering. (3F)

671. Bioprocesses in Engineered and Environmental Systems. (4F)

***672 (d562). Chemistry of Aquatic Systems.** (3Sp)

673 (d573). Analysis and Behavior of Environmental Contaminants. (3W)

674 (d574). Applied Fluid Mechanics. (3F)

675 (d575). Hydraulic Design. (3W)

676 (d576). Hydraulic Transients. (3Sp)

677 (f742). Water Resources Systems I. (3F)

678 (f743). Water Resources Systems II. (3W)

679. Water Resources Systems III. (3W)

680. Graduate Seminar. (1) ®

****687 (d587). Hazardous Waste Incineration.** (3W)

690. Directed Reading. (1-3) ®

692. Chemodynamics: Movement and Fate of Chemicals in the Environment. (3Sp)

693. Special Problems. (1-4) ®

695. Design Project. (3)

696 (d596). Management of Regulated Rivers. (3W)

697. Thesis Research. (1-9) ®

699. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

708. Plate and Shell Theory. (3)

709. Numerical Analysis of Plates and Shells. (3)

710. Plasticity in Structural Engineering. (3)

711. Material and Structural Modeling. (3)

712. Advanced Topics in Civil Engineering. (3)

720. Airport Systems Planning. (3W)

741. Stochastic Subsurface Hydrology. (3W)

744. Analysis of Water Resources Institutions. (3Sp)

745. Applied Engineering Microeconomics. (3F)

746. Advanced Topics in Hydrology. (3F)

747. Water Resources Planning. (3F)

752. Porous Media Flow. (3)

754 (f654). Spatial Hydrologic Analysis. (3Sp)

758. Advanced Finite Element Analysis. (3Sp)

****759 (f659). Inverse Problems and Hydrologic Model Identification.** (3Sp)

768. Applied Natural Systems Modeling. (3W)

797. Dissertation Research. (1-15) ®

799. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

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*Taught 1996-97.

**Taught 1997-98.

[1]Parenthetical numbers preceded by *d* indicate a *dual* listing; parenthetical numbers preceded by an *f* are the *former* course numbers.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Department of
Communication

College of Humanities, Arts and Social Sciences

Head: Professor Edward C. Pease
Office in Animal Science 310, 797-3292

Adjunct Professor Alan M. Hofmeister; **Professors Emeritus** Burrell F. Hansen, Nelson B. Wadsworth; **Associate Professors** Penny M. Byrne, Scott A. Chisholm, Donald T. Cundy, James O. Derry; **Adjunct Associate Professor** Lee Roderick; **Associate Professor Emeritus** Gerald L. Allen; **Assistant Professors** Steven D. Anderson, Brenda Cooper, Nancy M. Williams

Degrees offered: Bachelor of Science (BS) and Bachelor of Arts (BA) in Journalism; Master of Arts (MA) and Master of Science (MS) in Communication

Areas of specialization: Broadcast-News, Print-News, Public Relations/Corporate Communication, and Journalism Education

Objectives

The Department of Communication is a professionally-oriented department offering hands-on instruction in journalism and broadcasting. The department provides editorial content for various area newspapers, including *The Salt Lake Tribune, The Herald Journal,* and others. It also produces a daily cable TV newscast, *Cache Valley Headline News.* Using an integrated curriculum following a specific sequence of courses, students are trained for entry-level positions in mass media.

Requirements

Departmental Admission Requirements. Admission requirements for first quarter freshmen into the Department of Communication are the same as those described for the University on pages 8-11.

Journalism requirements. There is a mandatory sequence of courses which must be completed. Upon completion of the freshman course requirements, each student must have an overall 2.33 grade point average (GPA). Should the overall GPA fall below 2.33, the student will be placed on departmental probation for one quarter. If the GPA is not raised to 2.33, the student will then be dropped as a major from the journalism program. Any student transferring into the department is required to have a 2.33 overall GPA.

Graduation Requirements. Journalism majors must have a *C* or better in all communication courses taken after Comm 121 and 130, which require a *C+*, and maintain an overall university grade point average (GPA) of 2.33 (*C+*) to fulfill the departmental requirement for graduation. A journalism major requires a minimum of 47 credits and a maximum of 54 credits in communication. See departmental adviser for current course requirements and sequence of courses.

Journalism Undergraduate Curriculum

Freshman Year: Students majoring in journalism must complete the following courses before entering any sophomore courses: Engl 101 or 111; InsT 100; PolS 110 or Hist 170 or Econ 200; Comm 121, 130.

Sophomore Year: Comm 206; Comm 210, 232, 283.

Upon completion of the freshman and sophomore core courses, all students majoring in journalism will have the opportunity to concentrate in one of the areas of concentration. Students should be aware that the department has a specified sequence of courses. Majors must consult the department before enrolling in any communication course. Students interested in public relations or media management are required to build an individualized program of study in consultation with a departmental adviser.

Junior Year: Select 8 credits of laboratory courses from: Comm 310, 321, 370, 375, 383, 385, 387, 390, 484, 490 (2 credits each).

Senior Year: All students must choose one of the following two courses: Comm 503 and 565; and choose one of the following three courses: Comm 530, 531, and 583. Print and Broadcast students must also take the following two courses: Comm 502 and 513. Media Management students must also take the following three courses: Comm 502, 513, and 580.

Majors are to select 6-9 credits from the following courses, as suggested by their advisers. Senior skills courses are open to majors who have completed their junior-level lab requirements. Theory courses are open to majors and nonmajors.

Skills Courses: Comm 330, 384, 420, 425, 432, 480, 500, 504, 506, 530, 531, 583.

Theory Courses: Comm 317, 417, 452, 497H, 499, 502, 503, 513, 565, 580, 582, 587.

For detailed course requirements, obtain an official major requirement sheet from the Department of Communication. Requirements may change from time to time.

Nonteaching Journalism Minor

Contact a departmental adviser to develop an 18-credit minor. At least 9 credits must be in upper-division courses. Other graduation requirements are the same as those for majors.

Journalism Education Option

Students in this program must register with the College of Education and be enrolled in teacher education. Education majors must maintain a minimum grade point average (GPA) of 2.75.

Honors Program

There is also an Honors Plan for students desiring a degree "with Honors." For details, students should contact their academic

adviser and see page 31 in this catalog. Students interested in this option must take HASS 480H, and choose 20 credits from the following Honors courses, which are available within the department: Comm 420H, 497H, 502H, 503H, 513H, 531H, 565H, 580H, 582H, and 583H. A minimum 3.5 GPA in Communication courses is required.

Financial Support

In addition to University and College of Humanities, Arts and Social Sciences scholarships, grants, and loans, the Department of Communication offers several scholarships for undergraduate and/or graduate students. Most of these are limited to juniors and seniors. See department for details and deadlines. There are also part-time employment opportunities for students working on the department's media outlets. Applications are available in the department office.

Graduate Study

The Master of Arts (MA) and the Master of Science (MS) in Communication with emphases in print, photo, and broadcast journalism; and media-management are offered. See current *Graduate Catalog* for program descriptions. Application for admission to a graduate program is made through the School of Graduate Studies.

Communication Courses

SS 121. Introduction to Mass Communications. Structures, functions, political, social, and economic impacts of mass media: newspapers, books, magazines, radio, television, film, public relations, and advertising. (4F,W,Sp) ©

130. Writing for the Mass Media. The mechanics and techniques of reportorial writing. Prerequisites: typing ability; Engl 101, 111, or equivalent. (3F,W,Sp)

206. Photo and Electronic Journalism. Emphasis on functions of pictures in newspapers, magazines, television, and advertising. Practice in picture taking and darkroom procedures. Students furnish cameras and some materials. (3F,Sp)

210. Public Affairs Reporting. Skills and techniques of interviewing, researching public records, and reporting for media of mass communication. Prerequisite: *C*+ or better in Comm 121 and 130. (3F,W,Sp)

225. Introductory Communication Internship. Lower-division, on-campus internship. Students work with media-related campus units. Approval of instructor required; may not be repeated. (1-2F,W,Sp,Su)

232. Introduction to Research Methods. Proceeds from an examination of the rationale underlying the scientific method to a consideration of experiments, quasi-experiments, and surveys as tools of social science/communication research. (3W)

283. Introduction to Broadcasting. Introduction to broadcasting, including technical, legal, and production concepts. (3F,W)

310. Reporting Practicum. Lab work in reporting news for print and broadcast media. Prerequisite: Comm 210. (2F,W,Sp,Su)

317. Public Opinion, Persuasion, and Propaganda. Impact of media on the formation of public opinion through persuasion and propaganda. Techniques of media influence on thought and behavior. (3Sp)

321. Editing and Copy Reading. Laboratory work in editing news copy for style, usage, and presentation. Prerequisite: Comm 210. (2F,W,Sp)

330. Advanced Public Affairs Reporting. Coverage of local, state, federal courts; municipal, state, and federal government administration in the local community. Prerequisites: PolS 111 (American State and Local Government and Politics) and Comm 210. (3F)

370. Television Production. Lab work in studio production; use of studio and control room equipment. (2F,W,Sp)

375. Television Control Room Operations. Lab work in use of control room equipment; includes switching and video taping for operation of cable channel. (2F,W,Sp)

383. Newspaper Production Laboratory. Lab course in design, layout, and pasteup of newspapers. Prerequisite: Comm 210. (2W)

384. News and Documentary Writing. Newsroom organization and operations; selection of news stories; the newscast; the TV documentary; special events; features, commentary, and analysis. (3F)

385. Radio and TV Performance. Lab work in radio and TV announcing and improvement in voice articulation. (2F,W,Sp)

387. Audio Production. Laboratory work in use of voice, music, and sound to create radio programs. (2F,W,Sp)

390. Selling Media Space and Time. Instruction in the planning and preparation of media advertising sales presentations. Lab experience in the selling and servicing of actual accounts. (2W)

417 (d617).[1] Persuasion, Political Campaigns, and the Mass Media. Examines the role played by the mass media in American political campaigns with particular emphasis on paid political advertising. (3F)

420 (420H). Feature Writing. Instruction and practice in writing the newspaper feature story and short magazine article. Prerequisite: Comm 210 or consent of instructor. (3W)

425. Communication Internship. Supervised in-service training for print or broadcast students. By permission only. Repeatable to a total of 6 credits. (1-3F,W,Sp,Su) ®

432. Editorial Writing. Study of the editorial and opinion functions of mass media. Planning, researching, and writing editorials. Prerequisite: *C* or better in Comm 210. (2F)

452. Public Relations. Media and methods used in public relations work as required by corporations, public institutions, service organizations, and governmental agencies. Prerequisite: Comm 210 or instructor's consent. (3F)

480. Commercial and Continuity Writing. Creative aspects of commercial copy and dramatic scripts; writing, evaluating, and revising scripts; analysis and critique of local and national material. (3W)

484. Electronic News. Practice in use of electronic news gathering equipment and production of visual news materials. (2F,W,Sp)

490. Promotion and Distribution. Examination of the theory and practice of how media products, including newspapers, magazines, radio, and television, are promoted and distributed, with an emphasis on management and marketing functions. (2W)

497H. Senior Thesis. An in-depth paper or project culminating in a formal presentation. Required of all students for graduation from the Honors Program in communication. Students must also complete HASS 480H. (1-5F,W,Sp,Su)

499. Special Topics. Study of special topics in print, broadcast, photojournalism, or media management. (1-3F,W,Sp,Su) ®

500. Projects in Communication. Individualized readings and projects. Prerequisite: consent of student's adviser. Maximum of 6 credits may be counted toward a degree. (1-5F,W,Sp,Su) ®

502 (502H). Communication Ethics. Ethical theory and practice in interpersonal, group, organizational, and mass communication. (3Sp)

503 (503H). Mass Media and Society. Study of the criticisms, challenges, impact, and responsibilities of mass communications in modern society. Emphasis on performance and ethics of practitioners. (3W)

504. School Publications. Problems of advising staffs of school newspapers, yearbooks, and magazines. (3Su)

506. Advanced Photojournalism. Laboratory work in use of cameras to communicate news and to make social statements. Prerequisites: Comm 130 and 206. (3W)

513 (513H). Mass Media Law. Principles of the law of libel, privacy, copyright, press freedom, and responsibility as they apply to the news media. (3F)

530. Magazine Article Writing. Lectures and practice in preparing feature articles for magazines. Analysis of periodical markets. Prerequisite: Comm 210 or permission of instructor. (3F)

531 (531H). In-depth Reporting. Researching and reporting public affairs in depth. Prerequisite: Comm 210. (2Sp)

565 (565H). Mass Communication Theory. Intensive study of major theories and issues using models and research techniques. Application of these theories to significant societal problems. (3Sp)

580 (580H). Mass Media Management. Examines the methods, techniques, and principles of managing the media organization, including newspapers and broadcast stations. (3F)

****582 (582H). International Communications.** Study of mass communications within and between countries. Systems and techniques of mass communication. Possibilities of bringing about better understanding between countries and cultures. (3W)

583 (583H). Advanced Television Production. Projects to develop the imagination, creativity, and aesthetic judgment for different types of television programs, and to develop and perfect skill in television production. Prerequisite: Comm 370. (3Sp)

587. Educational Television and Radio. Production of radio and television materials for education uses; methods for effective classroom utilization of audio and visual materials and programs. (3W,Su)

Graduate[2]

601. Introduction to Mass Communication Graduate Study. (2F,W,Sp,Su)

610. Communication Theory and Technology for International Agricultural Extension. (3Sp)

611. Internship. (1-6F,W,Sp,Su) ®

617 (d417). Persuasion, Political Campaigns, and the Mass Media. (3F)

620. Feature Article. (3W)

625. History of Communication. (3F)

630. Reporting on Arts and Culture. (3W)

635. News Analysis, Commentary, and Editorials. (3F)

640. Seminar in Mass Media Issues. Repeatable to 6 credits. (1-3W) ®

650. Regional Issues. (3F)

670. Introduction to Research. (4F)

680. Research Seminar. (3Sp) ®

683. Television Direction. (3Sp)

685. Problems in Media Practice. Repeatable to 6 credits. (3F,W,Sp,Su) ®

687. Legal Issues in Mass Media. (3W)

690. Research Studies. (1-5) ®

697. Thesis. (1-9) ®

699. Continuing Graduate Advisement. (1-3) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

*Taught 1996-97.

**Taught 1997-98.

Department of
Communicative Disorders and Deaf Education
College of Education

Head: Professor Thomas S. Johnson

Office in Communicative Disorders 102C, 797-1381

Professors James C. Blair, Steven H. Viehweg; **Professors Emeritus** Frederick S. Berg, Thomas C. Clark, Jay R. Jensen; **Associate Professors** N. Brandt Culpepper, Beth E. Foley, Jess Freeman King, Sonia S. Manuel-Dupont, Carol J. Strong; **Assistant Professors** Nancy E. Benham, Jaclyn Littledike; **Clinical Assistant Professors** Kim Corbin-Lewis, Susan Watkins; **Clinical Instructors** Dee R. Child, Ann S. Eldredge, Anne Elsweiler, Janet K. Jensen, Jan Kelly-King, Elizabeth Parker, Sheryl Y. Spriet; **Research Instructors** Dorothy L. Johnson, Elizabeth Morgan, Lori Rowan; **Adjunct Clinical Instructors** Kathryn Snyder-Gantz, Sandra Bowen

Degrees offered: Bachelor of Science (BS) and Bachelor of Arts (BA) in Communicative Disorders; Master of Science (MS), Master of Education (MEd), and Master of Arts (MA) in Communicative Disorders with specializations in Clinical and Educational Audiology, Early Childhood Communicative Disorders, and Speech-Language Pathology; MEd in Education of the Deaf and Hard of Hearing; Educational Specialist (EdS) in Educational Audiology; participates in the interdepartmental Doctorate of Education (EdD) and Doctorate of Philosophy (PhD)

Objectives

Three major objectives of the Department of Communicative Disorders and Deaf Education are (1) to train competent speech-language pathologists, educators of the deaf and hard of hearing, and clinical-educational audiologists capable of receiving state and national certification; (2) to provide clinical services to individuals with speech-language deficits or hearing loss in the University population or in the community; (3) to provide a research opportunity for students relating to communicative problems of individuals. The programs in both Speech-Language Pathology and Clinical-Educational Audiology are fully accredited by the Educational Standards Board of the American Speech-Language-Hearing Association. The program in Education of the Deaf and Hard of Hearing is accredited by the Council on Education of the Deaf. All department programs hold Utah State Office of Education approval and NCATE accreditation.

Requirements

Departmental Admissions Requirements. Admission requirements for the Department of Communicative Disorders and Deaf Education are the same as those described for the University on pages 8-11. An undergraduate departmental application must be submitted in the fall quarter of the junior year.

Admission into the Professional Program. Students must apply to the Department of Communicative Disorders and Deaf Education for admission into the professional program. The professional program is a professional education program culminating in the master's degree. A 3.0 GPA overall is required for admission into the professional program. Transfer students or students applying for admission into the program subsequent to the fall quarter of their junior year must receive approval of the department head before beginning their matriculation in major classes.

An application for admission to teacher education must be completed by all majors during the junior year (see College of Education requirements, page 44). This approval is necessary for the student to take certification courses taught in the departments of Elementary Education, Special Education and Rehabilitation, and Secondary Education, which are supportive of the major, as well as to take the Communicative Disorders clinical practicum coursework.

Bachelor's degree in Communicative Disorders. Though the BS or BA degree is available, the student should be aware that there is no longer professional employment certification in communication disorders possible at the bachelor's level. All majors must complete a core curriculum consisting of ComD 240, 270, 310, 312, 322, 365, 375, 381, 398, 510, 549, 551, 560, and 583. The undergraduate major for communicative disorders consists of 65 quarter credits of courses specified by the department plus 6-10 quarter credits of extra departmental coursework. Current national board and state educational agency certification requirements demand more coursework than the minimum numbers required for University graduation.

Education of the Deaf and Hard of Hearing. Students wishing to obtain certification to teach the deaf and hard of hearing (Education of the Deaf and Hard of Hearing) will need to complete the requirements for a teaching certificate in early childhood education, elementary education, secondary education, or special education. In conjunction with meeting the requirements for certification, the student should also complete coursework in Communicative Disorders and Deaf Education, as directed by the department. The department has an undergraduate adviser for this program.

Students desiring supportive courses for majors in special education, elementary or secondary education, family life, psychology, or other related departments are advised to seek counsel from the department head in determining an effective minor core.

Graduate Study

The master's degree is required for the student to obtain recommendation for either state or national professional certification. Either the MS, MEd, or MA is offered with specialization in clinical-educational audiology, speech-language pathology, or education of the deaf and hard of hearing. Additionally, the Educational Specialist degree (EdS) is offered for those who have the master's degree and who are currently working in educational settings with the deaf and hard of hearing. See the University *Graduate Catalog* and the current department major requirement booklet for prerequisites and further information. The PhD program in the College of Education includes an emphasis area in educational audiology. For more information, see the *Doctoral Program in Education Guidebook* or contact the department.

Communicative Disorders and Deaf Education Courses

010. Communication Training. For students with communicative problems for which speech, language, and/or hearing treatment is needed. Prerequisite: instructor's consent. (1-2F,W,Sp,Su)

240. Orientation and Observation in Communicative Disorders. Introduces students to the professional responsibilities required of communicative disorders specialists in a variety of employment settings. Observation in different settings will be provided. (2F,W,Sp)

HU 270. Language, Hearing, and Speech Development. A cross-cultural consideration of the development of phonologic, syntactic, morphologic, lexical, and pragmatic language skills throughout the lifespan. Also introduces students to language, hearing, and speech disorders. (5F,Sp)

290. Independent Study. Selected work individually assigned, handled, and directed. Issues of mutual interest to students and the instructor are investigated and reported. (Not used for degree credit.) (1-5F,W,Sp,Su) ®

310. Fundamentals of Anatomy for Speech and Hearing. Basic study of the structures and functions associated with the subprocesses of speech and hearing, including respiration, phonation, resonation, articulation, hearing, and fundamental neurology. Prerequisite: Phyl 130 or consent of instructor. (5F)

312. Disorders of Articulation. Introduction to articulation disorders and related problems. Emphasis is directed at evaluation, management, and measurement of success. Principles of programming are presented. Prerequisites: ComD 270, 375. (5Sp)

322. Professional Writing in Communicative Disorders. Writing opportunities related to clinical management practices and professional report and paper writing for future professionals in communicative disorders. (1-3F,W,Sp) ®

SK 338. Sign Language I. Introduction to American Sign Language and Deaf Culture. Focus on receptive skills, with some instruction relative to rules, grammar, and culture associated with American Sign Language. Total immersion approach is used. (3F,W,Sp)

365. Clinical Processes and Behavior. A consideration of clinical management as an interactive process. Interpersonal sensitivity, technical knowledge and skills, professional infection-control measures, and behavior modification are core considerations. Prerequisites: ComD 270, Psy 101. (3Sp)

375. Developmental Phonology. Basic study of the sounds of English speech and the phonological subsystem of spoken language; developmental, descriptive, prescriptive, physiological, and acoustic features; applications in several disciplines. (5W)

381. Hearing Science. Study of the physics of sound and its interaction with people. Basic concepts of wave forms, sound propagation, decibel notation and sound measurement, and masking. (3W)

398. Basic Audiometry. Pure tone, speech audiometric, tuning fork, and air-conduction and bone-conduction tests. Prerequisites: ComD 270, 310, 381. (5Sp)

408 (d604).[1] Listening Problems in the Classroom. Hearing, speech, and listening considerations; room acoustics; hearing aids, FM equipment. For elementary, secondary, and special education educators. (1-4F,W,Sp)

430. Practica in Sign Language. Provides opportunities for graduate and undergraduate students to improve their sign language skills. Each student will supervise and train others in use of sign language. Prerequisite: ComD 338 or equivalent. (2F,W,Sp) ®

437. Sign Language II. Development of expressive and receptive skills in American Sign Language, focusing on idiom-like expressions, number systems, rules, grammar, and conversational language. Total immersion approach is used. Prerequisite: ComD 338 or instructor approval. (3F,W,Sp)

497. Senior Thesis. Student-initiated research project under faculty supervision. Prerequisites: satisfactory grade point average, instructor recommendation, and approval of Honors Committee. (1-9F,W,Sp,Su) ®

500. Institute in Communicative Disorders. Special colloquial offerings in communicative disorders. (1-5F,W,Sp,Su) ®

507. Speech Science I. Contemporary theory, research findings, clinical applications, and laboratory experiences in measurement and analysis of speech production. (3Sp)

510 (d609). Grammatical Analysis of Language Disability. Provides basic information in the clinical analysis of syntactic and morphological properties of productive language disorders. (5F)

528 (d628). Educational Audiology. Management of deaf and hard of hearing children in the regular schools; population and individual profiles; evaluation and staffing; models of delivery; integration considerations; remedial and facilitative programming. (3W)

540. Clinical Practicum in Communicative Disorders. Supervised diagnostic and remedial casework in communicative disorders. Prerequisite: admission to teacher education. (1-4F,W,Sp,Su) ®

542. Internship in Audiology. Supervised diagnostic and remedial practicum with individuals with hearing loss. Prerequisite: consent of instructor. (1-5F,W,Sp,Su) ®

549 (d649). Language Assessment. Evaluation of the language and communication skills of prelinguistic, preschool, and school-age children, using formal and informal assessment procedures. Prerequisites: ComD 270, 510, or equivalents. (4F)

551 (d652). Language Intervention for Infants, Toddlers, and Preschoolers. Language therapy for semantic, syntactic, and pragmatic aspects of language in infants and preschool children. Includes theoretical approaches, as well as published materials, and emphasizes parental role in intervention. Prerequisite: ComD 549. (3W)

553 (d653). Practicum in Education of the Deaf and Hard of Hearing. Supervised diagnostic and remedial casework in education of the deaf and hard of hearing. (1-4F,W,Sp,Su) ®

554. Introduction to Education of the Deaf and Hard of Hearing. Provides students entering the teacher preparation program for the deaf and hard of hearing with an overview and philosophical underpinning of teaching the deaf and hard of hearing. (3W)

556. Sign Language III. Development of expressive skills in American Sign Language. Class presentations by students must be in ASL and are critiqued by the instructor. Prerequisite: ComD 437 or instructor approval. (3F,W,Sp)

560. Aural Rehabilitation for Children. Introduction to the principles and techniques of aural rehabilitation, specifically related to intervention with preschool and school-aged children with hearing losses. (3W)

583. Introduction to Immittance Audiometry. Provides understanding of theory and application of immittance audiometry and develops skill in administration and interpretation of results. (2F)

590. Independent Study. Selected work individually assigned, handled, and directed. Problems of mutual interest to students and the instructor are investigated and reported. (1-8F,W,Sp,Su) ®

Graduate[2]

601. Audiology and Teachers of the Deaf and Hard of Hearing. (4F)

602. Socio-Cultural Aspects of Deafness. (3F)

604 (d408). Listening Problems in the Classroom. (1-4F,W,Sp)

606. Anatomy/Speech and Hearing for Teachers of the Deaf. (3F)

607. Speech Science II. (1W)

608 (f508). Internship in Audiology. (1-4F,W,Sp,Su) ®

609 (d510). Grammatical Analysis of Language Disability. (5F)

611. Neuropathologies of Speech. (4F)

613. Speech for the Deaf and Hard of Hearing. (3Sp)

615. Strategies for Teaching Speech to the Deaf and Hard of Hearing. (3F)

616. Family Interaction and Involvement with Handicapped Children. (3F,W,Sp,Su)

617. Implementation in Home Based Programs for Handicapped Children. (3F,W,Sp,Su)

618. SKI*HI Basic Training. (4)

619. INSITE Basic Training. (3F,W,Sp,Su)

620. Rehabilitative Audiology. (3Sp)

621. Communicative Disorders Related to Orofacial Anomalies. (4W)

622 (f521). Communicative Disorders Management in the Public Schools. (3F)

623. Assistive Devices/Applications in Communicative Disorders. (3W)

624. Special Auditory Tests. (5W)

626. Teaching Language to the Deaf and Hard of Hearing. (3Sp)

627. Strategies for Teaching Language to the Deaf and Hard of Hearing. (3F)

628 (d528). Educational Audiology. (3W)

631. Disorders of Fluency—Stuttering. (4F)

637. Sign Language IV. Prerequisite: ComD 437, 556, or instructor approval. (3W)

638. Programming for the Young Deaf and Hard of Hearing Child. (4W)

639. Educational Audiological Evaluation and Referral. (3Sp,Su)

640 (f541). Internship in Speech Pathology. (1-5F,W,Sp,Su) ®

641. Public School Internship in Speech Pathology. (1-4F,W,Sp,Su) ®

642. Diseases of the Ear. (3F)

644. Public School Internship in Audiology. (1-12) ®

645. Early Intervention for Infants and Toddlers With Vision Impairment and Their Families. (4F,W,Sp)

646. Serving Preschoolers with Vision Impairments in Center Based Settings. (4F,W,Sp)

647. Sign Language V. Prerequisite: ComD 637; ComD 510 recommended. (3Sp)

649 (d549). Language Assessment. (4F)

650. Teaching Reading to the Deaf and Hard of Hearing Children. (3W)

651. Externship in Speech Pathology. (1-12F,W,Sp,Su) ®

652 (d551). Language Intervention for Infants, Toddlers, and Preschoolers. (3W)

653 (d553). Practicum in Education of the Deaf and Hard of Hearing. (1-4F,W,Sp,Su) ®

654. Deaf and Hard of Hearing Children With Multiple Disabilities. (3F)

655. Curriculum Adaptations for Teachers of the Deaf and Hard of Hearing. (3F)

657. Mainstreaming the Deaf and Hard of Hearing. (3W)

658. Educational Audiological Management of the Hearing Impaired. (3F,Su)

659. Psychology and the Deaf and Hard of Hearing. (3W)

668. Industrial Audiology. (3W)

672. Internship in Education of the Deaf and Hard of Hearing. (3-9F,W) ®

673. Student Teaching in Education of the Deaf and Hard of Hearing. (3-9Sp)

674. Associate Teaching in Hearing Impairment. (3-9Sp)

675. Introduction to Research in Communicative Disorders. (3Sp)

678. Professional Practice. (3F)

679. Pediatric Audiology. (3W)

680. Advanced Hearing Science. (5F)

681. Management of Voice Problems. (4W)

684. Disorders of Motor Speech in Pediatric/Adult Populations. (4Sp)

685. Seminar in Communicative Disorders. (2F,W,Sp,Su)

687. Hearing Aids. (5F)

688. Electrophysiological Auditory Tests. (5Sp)

689. Assessment and Educational Services for the Bicultural/Bilingual/Bidialectal Child. (3W)

690. Independent Study. (1-12F,W,Sp,Su) ®

691. Independent Research. (1-12F,W,Sp,Su) ®

692. Advanced Hearing Aids. (3F)

693. Advanced Clinical Audiology. (3W)

696. Master's Project. (2-6F,W,Sp,Su) ®

697. Thesis. (1-9F,W,Sp,Su)

698 (f598). Externship in Audiology. (1-12F,W,Sp,Su)

699. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

733. Supervision Internship. (1-10) ®

751. Supervision in Communicative Disorders. (3Su)

781. Research Seminar in Educational Audiology. (1-6)

790. Independent Study. (1-3F,W,Sp,Su) ®

791. Independent Research. (1-3F,W,Sp,Su)

797. Dissertation. (1-12F,W,Sp,Su)

799. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing; parenthetical numbers preceded by an *f* are the *former* course numbers.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Department of
Computer Science

College of Science

Head: Associate Professor Donald H. Cooley
Office in Main 414, 797-2451

Associate Head: Associate Professor Gregory W. Jones
Office in Main 420, 797-3267

Professor Scott R. Cannon; **Professors Emeritus** Rex L. Hurst, Wendell L. Pope; **Associate Professors** Stephen J. Allan, Vicki H. Allan, Heng-da Cheng, Nelson T. Dinerstein, Larre N. Egbert; **Assistant Professors** Stephen W. Clyde, Nicholas Flann, Daniel W. Watson, Jianping Zhang

Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA) (students can earn a BA degree by completing two years of a foreign language), and Master of Science (MS) in Computer Science

Objectives

The course of study offered by the Department of Computer Science is directed primarily toward developing the problem solving skills of its students. This, in conjunction with the understanding of computers and computer systems provided by coursework, will enable a graduate of the program to apply his or

her knowledge to finding solutions to problems that arise in the sciences, business, industry, government, and education sectors.

Students who have the ability to think analytically and creatively will find a challenging and exciting future in computer science.

Opportunities for practical applications of computer science skills are available with members of the computer science faculty who are engaged in research and consultation work both on and off campus.

Computer Science

Computer Science deals with information structures and processes as they are represented and implemented in modern high-speed digital computers, and with information processing systems designed to implement useful applications of computing.

The program in computer science attempts to provide a solid foundation of knowledge about computers and to teach a mode of thinking which will permit continuing growth on the part of graduates. Prospective students should have an aptitude for mathematics and logic and an interest in analysis and deduction.

Computer science is one of the fastest growing fields of study in our society. Excellent employment opportunities are available to computer science graduates. All of the major corporations hire computer science graduates. Graduates in Computer Science work for such Utah-based corporations as Novell, WordPerfect, Evans and Sutherland, TRW, Thiokol, and Hercules.

The Computer Science bachelor's degree is a four-year degree with areas of emphasis or options in Science, Digital Systems, and Information Systems. In addition, by working with a departmental adviser, students may develop a plan of study tailored to their own unique career objectives.

Science Option

The Science Option is designed for those who plan to pursue scientific or technical careers, research, or graduate education in computer science. Students choosing the science option will take courses in programming languages, the theory of computation, scientific applications, and math courses in calculus, linear analysis, and multi-variable calculus. Additional courses include a variety of upper-division computer science courses, chosen in consultation with an adviser.

Digital Systems Option

The Digital Systems Option is available for those interested in both the hardware and software aspects of computer systems. In addition to computer science and mathematics courses, students in this option will take electrical engineering courses in electronics, circuits, digital fundamentals, microcomputer systems, and digital system design. The curriculum for students in this option is similar to that for students in the computer engineering option of Electrical Engineering.

Information Systems Option

The Information Systems program at Utah State University offers a common core of courses through two department majors, Business Information Systems and Education and Computer Science. The curricula of the individual departments differ substantially in emphasis.

The Computer Science major with an Information Systems option is designed for students interested in a career as a Computer Scientist with a background in Information Sciences and Systems. Majors in this option are trained in all phases of the analysis, design, and implementation of Information Systems. As part of this option, students also receive training in the theory and application of information with courses in Telecommunications and Expert Systems. Students select an application area such as Business, Accounting, or Economics. Other application areas can be developed by working closely with an adviser. This program of study, offered within the College of Science, leads to a Bachelor of Science, Bachelor of Arts, or Master of Science degree in Computer Science.

The Business Information Systems major, Information Systems Management emphasis, is offered in the Business Information Systems and Education Department, College of Business. The Bachelor of Science or Bachelor of Arts program is designed for students interested in business careers as information specialists, systems analysts, and information systems managers in business and industry. BIS majors take required courses in analysis and design, decision support systems, spreadsheet and database applications, and information systems projects. All graduates are required to complete a common core of business subjects to include a Business Administration minor. The College of Business is accredited by the American Assembly of Collegiate Schools of Business. The department also offers a Master of Science in Business Information Systems and Education with an area of emphasis in Information Systems Management. See page 92 for additional details.

Department and General College of Science Requirements

Orientation Requirement. All students graduating from the College of Science are required to take the college orientation course: Sci 150, Science Orientation.

Written Communications Requirement. In addition to the University's written communication requirement, the college requires a junior level writing class. This requirement may be filled by completing either English 301 or 305.

Bachelor of Science Core Requirements. Students working toward the Bachelor of Science degree in Computer Science must complete the following:

A. Math 220 and 221.

B. Either CS 160 or Stat 201.

C. One of the following sequences: (1) Biol 125, 126, and 127; (2) Chem 121, 122, 123, and 124; (3) Phyx 221, 222, and 223.

At least two additional science courses must be taken. Students must earn at least 3 credits in each course, and must select the courses from departments in the College of Science, excluding Computer Science. The following restrictions apply:

1. For the Information Systems option, students must earn at least 8 credits in these two courses.

2. AP credit can be used to meet this requirement *only* if the AP credit is in a department other than that of the science sequence course.

3. Any science course having the science sequence as a prerequisite will be acceptable.

4. The following courses are acceptable: FW 284; Micb 111, 112; Phyl 130; Geol 111, 200.

5. Any other courses used to meet this requirement must be preapproved by a Computer Science adviser.

Requirements

Summary of Departmental Admission and Retention Requirements

Admission requirements of the Department of Computer Science for freshmen are the same as those described for the University on pages 8-11. Transfer students with a 2.5 GPA may apply for admission to the department.

Before a student can register for a CS course, he or she must earn a grade of *C-* or better in all prerequisite courses. All required computer science classes must be completed with a grade of *C-* or better. Required courses, regardless of department, may not be taken pass-fail, and a Computer Science major must have advanced standing to register for a course at the 400-level or above.

For a more complete statement of requirements, please contact the department directly. Requirements may change from time to time.

Bachelor of Science Degree

The department offers a degree program with emphases in science, digital systems, or information systems. The objectives are to train computer scientists who can relate to science, computer design, or business disciplines. Other areas of emphasis will be considered on an individual basis.

COMPUTER SCIENCE REQUIRED COURSES[1]

Science Option

CS 170, 171, 172, 220, 227, 327; CS 355, or ECE 272 and 273; CS 356, 410, 427, 470, 510; Stat 301; Math 220, 221, 222, 320, 321, 322, 331; Math 461 or 463 or 561; Stat 301; Phil 111; 3 three-course track electives[2]; one quantitative/scientific methods course[3]

Digital Systems Option

CS 170, 171, 172, 220, 227, 327, 355, 356, 410, 427, 470, 510; ECE 211, 212, 272, 273, 310, 311, 312, 376, 377, 477, 577; Math 220, 221, 222, 320, 321, 322, 331; Math 461 or 463 or 561; Stat 301; Phil 111; 2 three-course track electives; one quantitative/scientific methods course

Information Systems Option

CS 170, 171, 172, 220, 227, 327; CS 355, or ECE 272 and 273; CS 356, 410, 427, 470, 510, 517, 518; two of CS 527, 528, or 577; Acct 201, 203; Stat 301; BA 308; MHR 311; Econ 200; Math 220, 221, 222, 331; Phil 111; 1 three-course track elective; 2 300-level or above courses selected from the following departments: Business Administration, Management and Human Resources, Accountancy, or Economics.

Minors

Minors are offered with emphasis in two areas. Also, minors may be tailored to meet a student's needs by consultation with a departmental adviser, before commencement of the minor.

Before beginning any minor, a student must meet with a departmental adviser.

Computer Science

CS 170, 171, 172, 220; two additional CS classes, one numbered 200 or above and one numbered 400 or above

Teaching Minor

Students working toward a degree in secondary education can receive a computer science teaching minor, which will qualify them to teach the full range of computer science courses offered in junior and senior high schools.

Required courses (23 credits):

CS 150, 170, 171, 172, 220; InsT 516, 524

Elective courses (3 credits minimum):

BIS 140; CS 101, 227, 241, 251, 327, 355, 356, 541; InsT 617, 619, 627, 638

Graduate Study

The department offers the Master of Science degree in Computer Science. See the *Graduate Catalog* for further information.

Computer Science Courses

PS 101. Computers and Their Uses. Computer science concepts, operations, history, and impact in modern society. Laboratory instruction in use of MacIntosh and IBM-compatible computers. No prerequisites. (5F,W,Sp,Su)

SK 150. BASIC Programming. Use of the language BASIC to teach problem solving skills on a computer. BASIC is the language most commonly supported on small computers, including home computers. Three lectures, one recitation. No prerequisites. (4F,W,Sp,Su)

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[1]Changes or additions to these requirements may occur from time to time. Students are required to contact the department office for current requirements.

[2]Contact the department office for a listing of track electives

[3]Contact the department office for a listing of quantitative/scientific methods courses.

SK 160. Elementary Computer Science, Algorithms, and Problem Solving. An introductory computer science course emphasizing problem solving strategies, hands-on introduction to computers, fundamental concepts of computer science, and the elementary aspects of algorithm design. Prerequisite: Math 105. (4F,W,Sp)

SK 170. Computer Science I. Introductory concepts of programming in the C programming language, historical and ethical aspects of computing, elementary data structures, algorithm design and analysis. Prerequisite: CS 160. Math 106 must be taken previously or concurrently. (4F,W,Sp,Su)

SK 171. Computer Science II. Advanced programming in the C programming language, complex data structures and algorithms, recursion, software development concepts, mathematical and scientific applications of computing. Prerequisite: CS 170. Math 220 or 215 must be taken previously or concurrently. (3F,W,Sp,Su)

SK 172. Computer Science III. Introduction to algorithms and data structures in the C++ programming language. Prerequisite: CS 171. (3F,W,Sp,Su)

220. Algorithms and Data Structures. A study of binary search trees, threads, huffman trees, game trees, sorting methods and analysis, searching, hashing, graph problems, Warshall's algorithm, graph traversals, spanning forests. Prerequisite: CS 172. (3F,W,Su)

225. Cooperative Work Experience. This course provides credit for students who work at a participating firm under faculty supervision. (1-9F,W,Sp,Su) ®

227. UNIX Systems. A study of UNIX operating system, covering utilization, file systems, structure, interfacing, communications, architectural considerations, and security. Prerequisite: CS 170. (4F,W,Su)

SK 241. FORTRAN Programming. Use of a problem-oriented language in solving problems by means of a computer. FORTRAN is principally used for scientific programming. Prerequisite: prior programming experience. (3Sp)

SK 251. COBOL Programming. Students are expected to learn the fundamentals of COBOL and gain experience in writing COBOL programs. COBOL is principally used for programming in business. Prerequisite: CS 150 or CS course numbered greater than 150. (3F)

252. Advanced COBOL. Brief introduction to elementary topics followed by a more intense study of advanced topics: report writer, sorting, merging, file handling, string processing. Intended for CS majors who have completed CS 172, and for nonmajors who have completed CS 172 or 251. Prerequisites: CS 172 or 251. (3W)

260. Programming in C. Introduction to software development using the C programming language and environment. Prerequisite: prior programming experience. (3W)

327. Software Engineering I. Basic principles of software engineering, software design, database systems, and professional ethics. Prerequisite: CS 220. (3W,Sp)

355, 356. Introduction to Computer Architecture. Discussion of the structure of various computer systems. Computer information storage and representation, input-output, and trends in computer architecture. Symbolic coding at the assembly level. Prerequisites: CS 171 is required for 355; CS 355 or ECE 273 is required for 356. (4W) (4Sp)

410. Operating Systems. Presents a survey of the theory of operating systems and their implementation. Prerequisite: CS 227. (3F,Sp)

425. Cooperative Work Experience. This course provides credit for students who work at a particular firm under faculty supervision. (1-9F,W,Sp,Su) ®

427. Software Engineering II. Presents intermediate concepts of the software development life-cycle and of procedural, economic, and legal aspects of software development. Prerequisite: CS 327. (3F—1996; 3F,Sp—1997)

470. Programming Languages: Analysis and Comparison. An analysis and comparison of major families of programming languages including features available, areas of use, implementation considerations, and support of data abstraction. Prerequisite: CS 220. (3F—1996; 3F,Sp—1997)

471. Topics in Computer Science (Topic). Special topics class for undergraduates. Prerequisite: permission of instructor. Taught through extension only. (1-6Sp)

495. Undergraduate Research. The student will participate in research projects and study developments and material in computer science not available in current coursework. Prerequisite: permission of instructor. (1-5F,W,Sp,Su) ®

505. Parallel Programming. Programming methodologies for highly parallel computers. Topics include concurrent programming, distributed programming, and implementation issues. Prerequisite: CS 220. (3F)

510. Finite Automata Computability and Complexity. A treatment of formal grammars, finite and push down automata, Turing machines, and the theory of computability, decidability, and complexity. Prerequisite: CS 220. (3F,Sp)

***511. Distributed and Parallel Operating Systems.** Concepts and methods for distributed consensus, reliability and recovery, concurrency control, deadlock, mutual exclusion, file systems, and related topics. Prerequisite: CS 410. (3Sp)

517. Theory of Database Management Systems. Relational, hierarchical, and network systems. Schemas, constraints, properties, and languages. Comparison of systems. Prerequisite: CS 220. (4W)

518. Information Systems Development. Life cycles, politics, technology. Techniques of analysis, design, and implementation. Files, interface, testing. Inputs, reports, processes. Database applications. Implementation of a commercial quality system. Prerequisite: CS 517. (3Sp)

525. Computer Modeling and Simulation. Introduction to simulation and comparison with other techniques. Discrete simulation models and discrete change simulation. Analysis of data generated by simulation experiments and validation of simulation models and results. Prerequisites: Stat 301 and CS 171. (3Sp—1996; 3F—1997)

527 (d627).[4] Software Engineering. Advanced techniques for software development, concentrating on project management, analysis, specification, and design. Prerequisite: CS 427. (3W)

528. Graphical User Interfaces, the OSF/Motif Toolkit, and the X-Window System. Design principles of GUIs and the philosophy, structure, and programming of X-Windows applications using Motif. Prerequisite: CS 220. (3Sp)

530, 531. Compiler Construction. Review of program language structures, translation, loading, execution, and storage allocation. Compilation of simple expressions, statements, and declarations. Organization and design of a compiler. Prerequisites: CS 220 and 470 are required for 530; CS 530 must be taken prior to 531. (3W) (3Sp)

541, 542. Computer Graphics. A two-quarter sequence introducing the concepts of graphics techniques and digital representation of information. Prerequisites: CS 171 and Math 321 are required for 541; CS 541 must be taken prior to 542. (3F) (3W)

549. Expert Systems and Applied Artificial Intelligence. Expert systems and other problem solving techniques. Existing tools used to solve practical problems. (3Sp)

553. Computer Vision and Pattern Recognition I. Application of computer to vision and pattern recognition. Image formation, image processing, motion analysis, syntactic and statistical pattern recognition. Prerequisites: CS 220, Stat 301, Math 321. (3W)

555. Algorithms. Study of algorithms and complexity analysis including: priority queues, equivalence relations, search trees, geometric algorithms, greedy, divide and conquer, dynamic programming, iterative methods, parallel and distributed algorithms. Prerequisite: CS 220. (3W)

****556. Design and Analysis of Parallel Algorithms.** Parallel complexity classes, models of parallel computation, and trade-offs between portability, programming, and performance. Parallel algorithms in a wide variety of areas. Prerequisite: CS 220. (3Sp)

560. Artificial Intelligence I. An introduction to artificial intelligence languages. LISP and PROLOG, programming techniques, and applications of these two languages to some simple AI problems. Prerequisite: CS 220. (3F)

571. Topics in Computer Science (Topic). Current topics in computer science, as determined by advances in the field. For advanced undergraduate or graduate students. Prerequisite: advanced standing as a CS major or permission of instructor. (1-6Sp) ®

***577. Distributed Software Systems.** Introduction to distributed software systems, including client/server and peer architectures, transparency, file and directory services, remote procedure calls, migration and replication strategies, collaborating servers, and security. Prerequisite: CS 511. (3F)

595. Independent Study. Provides for independent study of selected topics. Prerequisite: permission of instructor. For use in the Ogden area only. (3-6F,W,Sp,Su) ®

Graduate[5,6]

605. Advanced Parallel Programming. Prerequisite: CS 505. (3Sp)

615. Theory of Relational Database Systems. Prerequisite: CS 517. (3Sp—1996; 3F—1997)

621. Parallel Computer Systems. Prerequisite: CS 505. (3W)

625. Cooperative Work Experience, Graduate. (1-9F,W,Sp,Su) ®

***626. Object-Oriented Models and Methods.** Prerequisite: CS 427. (3F)

627 (d527), 628. Software Engineering. Prerequisites: CS 427 is required for 627; CS 627 must be taken prior to 628. (3W) (3Sp)

632. Supercompilers for Supercomputers. Prerequisite: CS 531. (3F)

633. Massive Parallelism. Prerequisite: CS 505. (3W)

641. Advanced Computer Graphics. Prerequisite: CS 542. (3Sp)

650. Artificial Intelligence II (Advanced Topics). Prerequisite: CS 560. (3W)

651. Selected Topics in Artificial Intelligence. Prerequisite: CS 650. (3Sp)

653. Computer Vision and Pattern Recognition II. Prerequisite: CS 553. (3Sp)

654. Theory and Application of Neural Networks. Prerequisites: Stat 301, Math 321. (3W)

671. Topics in Computer Science (Topic). Prerequisite: CS 220. (1-3Su) ®

690. Seminar. (1-5F) ®

695. Reading and Reports. (3-6) ®

697. Thesis and Research. (1-9) ®

699. Continuing Graduate Advisement. (1-3) ®

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[4]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[5]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

[6]Not all graduate courses are taught each year. Please see the department for current course offerings.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

*Taught 1996-97.

**Taught 1997-98.

Department of
Economics

*College of Agriculture and College of Business**

Head: Professor Donald L. Snyder
Office in Business 615, 797-2310

Professors DeeVon Bailey, Basudeb Biswas, Reed R. Durtschi, Herbert H. Fullerton, Terrence F. Glover, E. Bruce Godfrey, Gary B. Hansen, Bartell C. Jensen, John E. Keith, W. Cris Lewis, Kenneth S. Lyon, Darwin B. Nielsen, H. Craig Petersen, Morris D. Whitaker; **Professors Emeritus** Roice H. Anderson, Rondo A. Christensen, Lynn H. Davis, Allen D. LeBaron, N. Keith Roberts, Morris H. Taylor; **Associate Professors** Larry K. Bond, Christopher Fawson, L. Dwight Israelsen; **Associate Professor Emeritus** Glenn F. Marston; **Assistant Professors** Christopher B. Barrett, Amitrajeet A. Batabyal, Leslie J. Reinhorn, Dawn D. Thilmany, Quinn R. A. Weninger; **Human Resources Specialist** Marion T. Bentley; **Lecturers** Tyler J. Bowles, Sarita Mohapatra

Degrees offered: Bachelor of Science (BS) in Agribusiness Management and Agricultural Economics; Master of Science (MS) and Master of Arts (MA) in Agricultural Economics; BS, Bachelor of Arts (BA), MS, and MA in Economics; Master of Community Economic Development (MCED); participates in Master of Social Sciences (MSS); Doctor of Philosophy (PhD) in Economics

Objectives

The objective of the Department of Economics is to provide students with the intellectual framework and reasoning ability necessary to understand and analyze economic problems and to make informed decisions. A basic understanding of economics is essential to becoming a well-informed citizen, as well as a successful business or public leader.

The Department of Economics offers Bachelor of Science degrees in Agribusiness and Agricultural Economics through the College of Agriculture, and a Bachelor of Science in Economics through the College of Business. The Agribusiness degree has two areas of emphasis: Food Marketing and Food Production. There are three areas of emphasis within the Economics degree: Traditional Economics, Prelaw Economics, and Managerial Economics. Minors are offered in Agribusiness, Agricultural Economics, Economics, and Managerial Economics. Students may not obtain more than one minor or bachelor's degree from the department.

All degree programs offered by the department include supporting courses in written communication, mathematics, computer science, business administration, management, accounting, statistics, and law. All majors do a senior project in which they identify and analyze a current problem, and in doing so, bring together and put into practice many of the concepts and methods they have learned in their coursework.

Career Opportunities

The Department of Economics prepares students for careers in government and business. Government work is with agencies such as the Department of Labor, Department of Agriculture, World Bank, and United Nations. Positions with these organizations include careers in research and planning, trade restrictions and policies, problems of labor and management, development, and economic factors in the use and conservation of natural resources. In private industry, economists work in all areas of business, including sales and service, farm credit and banking, financial management, and international trade. They provide expertise in completing price analyses and feasibility studies, and in forecasting market conditions and consumer trends. Many go into business for themselves and operate their own farm, ranch, or other type of business. Economics also prepares students for graduate studies in economics, agricultural economics, law, and MBA programs.

Admission and Prespecialization

Admission. Freshmen who meet the admission requirements and are accepted in good standing by the University are eligible for admission to the College of Agriculture, the College of Business, and the Department of Economics. All transfer students, whether transferring from within Utah State University or from other colleges and universities, must have an overall minimum GPA of 2.5 to be accepted as majors in Agricultural Economics, Traditional Economics, and Prelaw Economics. Students must have an overall minimum GPA of 2.5 to transfer into the department as a major in Agribusiness or Managerial Economics.

New students wishing to major in the Department of Economics may do so by listing one of the departmental majors on their application when they apply for admission to USU. Students enrolled at USU may change to a departmental major by applying directly to the College of Agriculture, the College of Business, or the Department of Economics.

An "advising and orientation flag" has been installed in the central computer used for registration at USU. Before new students, including freshmen and transfer students, can register for classes, this flag must be released. Each student must do one of the following, in order to have the flag released: (1) attend a summer orientation, advising, and registration session on campus; (2) request an orientation and advising packet by mail through the Academic Services Office at (801) 797-1128 or (800) 432-8615; or (3) consult with the departmental undergraduate academic adviser by calling (801) 797-2310.

Prespecialization. Majors in Agribusiness and Agricultural Economics should complete the following courses or their equivalents during their freshmen and sophomore years, in preparation for taking upper-division classes in economics and business: Acct 201, 203; BIS 140; Econ 200, 201; Math 105, 215; Stat 230 (Agribusiness), or Stat 301 and 502 (Agricultural Economics).

*The Department of Economics is in the College of Agriculture and the College of Business. Programs in both Agricultural Economics and Economics are offered.

To prepare for taking upper-division economics, business, and management classes, majors in Economics should complete the following prespecialization courses or their equivalent: Acct 201, 203; BIS 140, 255; Econ 100, 200, 201; Math 105, 215; Stat 230, or Stat 301 and 502. Completion of these courses, with a minimum GPA of 2.50 and an overall GPA of 2.50 (which includes transfer credits), qualifies a student for Advanced Standing, a requirement for graduation in Economics.

University Graduation Requirements

All students graduating with a major in the Department of Economics must successfully complete the following University requirements: (1) 6 credits of written communication, including Engl 101, and Engl 200 or 201; (2) 40 credits of general education (for social science majors); (3) a minimum of 186 total credits; (4) at least 150 credits with a grade of *C* or better; (5) a minimum of 60 upper-division credits; and (6) at least 45 credits in residence at USU, 15 of which must be within the last 60 credits presented for the degree. The minimum 186 total credits may not include more than 120 transfer credits from junior colleges. In addition, the Department of Economics provides that the minimum 186 total credits may not include more than 25 credits earned through the Intensive English Language Institute (IELI) program.

Departmental Requirements for Bachelor of Science in Agribusiness Management

The Agribusiness Management degree prepares students for employment in business, finance, marketing, and farm and ranch management.

Graduation requirements for a Bachelor of Science degree in Agribusiness Management include all of the Unversity and prespecialization requirements listed above, plus BIS 255 or ASTE 305 or Engl 305; Econ 331, 340, 400, 401, 402, 403, 502, 503, 504, 535; Econ 595, or Econ 485H and 495H; 3 additional credits in economics courses numbered 300 or above; MHR 299, 311; BA 308, 340, 350, 370; BIS 245 or ASTE 309.

To graduate in Agribusiness Management, a student must have an overall GPA of 2.5 or higher, as well as a minimum GPA of 2.5 in Economics courses. An overall GPA of 2.5 or higher is required for admission into some required BA and MHR courses. All prespecialization and additional required courses listed above must be taken for a letter grade.

Students may graduate in Agribusiness Management without specifying an area of emphasis by completing the requirements listed above, or they may choose one of the two areas of emphasis within this degree—food marketing or food production—based on their career interests, by completing a minor in an appropriate area of emphasis as indicated below.

Agribusiness—Food Marketing Emphasis. Students who complete a minor in Nutrition and Food Sciences or Marketing may graduate with a degree in Agribusiness—Food Marketing Emphasis.

Agribusiness—Food Production Emphasis. Students who complete a minor in Agricultural Systems Technology and Education, Agronomy, Animal Science, Biometeorology, Dairy Science, Ornamental Horticulture, Plant Science, or Soil Science may graduate with a degree in Agribusiness—Food Production Emphasis.

Minor in Agribusiness Management. The requirements for a minor in Agribusiness Management are Acct 201; Econ 201, 303 or 503, 403, and 535; plus two of the following courses: Econ 331, 340, 401, 402, 502, 504; MHR 299. Students must earn a GPA of at least 2.2 in these courses.

Optional Dual Major in Business. Students majoring in Agribusiness Management are encouraged to also obtain a dual major in Business through the College of Business to widen the horizon of their employment possibilities. Requirements for the dual major in Business are Acct 201, 203; BA 308, 340, 350, 370; BIS 140, 245; Econ 200, 201, 340, 400 or 401; Math 105, 215; MHR 299, 311, 489; and Stat 230. A GPA of at least 2.5 is required in these courses. Many of these courses are also required for the Agribusiness Management major.

Departmental Requirements for Bachelor of Science in Agricultural Economics

This degree is designed for students who plan to attend graduate school or law school, or enter a specialized career field requiring skills in quantitative analysis.

Graduation requirements for a Bachelor of Science degree in Agricultural Economics include all of the University and prespecialization requirements listed above, plus: BIS 255 or ASTE 305 or Engl 305; Econ 331, 402, 403, 500, 501, 502, 503, 504, 531, 532, 533, 540; Econ 595, or Econ 485H and 495H; 10 additional credits in economics courses numbered 300 or above; BIS 245 or ASTE 309; and MHR 299.

To graduate in Agricultural Economics a student must have an overall GPA of 2.2 or higher, as well as a minimum GPA of 2.2 in Economics courses. All prespecialization and additional required courses listed above must be taken for a letter grade.

Minor in Agricultural Economics. The requirements for a minor in Agricultural Economics are Acct 201; Econ 201, 402, 403, 503; plus two of the following courses: Econ 501, 504, 531, 532, 554, 556, 580, 585. Students must earn a GPA of at least 2.2 in these courses.

Departmental Requirements for Bachelor of Science in Economics

Graduation requirements for a Bachelor of Science in Economics include all of the University and prespecialization requirements listed above, plus the following additional courses, depending on the area of emphasis chosen to fulfill graduation requirements.

Economics—Traditional Emphasis

This area of emphasis is designed for students who are planning to go on to graduate study in economics and those pursuing a career requiring skills in quantitative analysis.

In addition to the University and prespecialization courses listed above, requirements for this emphasis are: Econ 340, 500, 501, 510, 531, 532, 533, 540; Econ 595, or Econ 485H and 495H; plus an additional 26 credits in economics courses numbered 300 and above; BIS 245; MHR 299.

To graduate with this area of emphasis within Economics, a student must have an overall GPA of 2.2 or higher, as well as a minimum GPA of 2.2 in Economics courses. All prespecialization

and additional required courses listed above (not including Econ 100) must be taken for a letter grade.

Students majoring in Traditional Economics are encouraged to complete one or more minors in Accounting, Business Administration, Computer Science, Finance, Management, Marketing, Math, Political Science, and/or Statistics.

Minor in Economics. The requirements for a minor in Economics are Econ 200, 201, 340, 500, and 501; plus an additional 9 credits from: Econ 504, 510, 515, 531, 532, 533, 540, 556, 580, and 585. Students must earn a GPA of at least 2.2 in these courses.

Economics—Prelaw Emphasis

This area of emphasis is for students who plan to attend law school or pursue a career related to political science, and who want to obtain a strong foundation in economics.

In addition to the University and prespecialization courses listed above, requirements are: Econ 340; Econ 400 or 500; Econ 401 or 501; Econ 510, 530; Econ 595, or Econ 485H and 495H; plus an additional 20 credits in economics courses numbered 300 or above; BIS 245; PolS 101, 110, 120, plus an additional 8 credits of political science courses numbered 300 and above.

To graduate with this area of emphasis within Economics, a student must have an overall GPA of 2.2 or higher, as well as a minimum GPA of 2.2 in Economics courses. All prespecialization and additional required courses listed above (not including Econ 100) must be taken for a letter grade.

Students majoring in Prelaw Economics are encouraged to complete one or more minors in Accounting, Business Administration, Computer Science, Finance, Management, Human Resource Management, and/or Political Science.

Economics—Managerial Emphasis

This area of emphasis is for students who are planning for careers in business. The program can serve as a terminal program for those planning to enter the job market on graduation or as excellent preparation for students who intend to pursue an MBA.

In addition to the University and prespecialization courses listed above, requirements are: Econ 340, 400, 401, 531, 532, 533, 540; Econ 595, or Econ 485H and 495H; plus an additional 15 credits in Economics courses numbered 300 or above; BIS 245; BA 340, 350, 370; MHR 299, 311.

To graduate with this area of emphasis in Economics, a student must have an overall GPA of 2.5 or higher, as well as a minimum GPA of 2.5 in Economics courses. An overall GPA of 2.5 or higher is required for admission into some BA and MHR courses. All prespecialization and additional required courses listed above (not including Econ 100) must be taken for a letter grade.

Students majoring in Managerial Economics are encouraged to complete one or more minors in Accounting, Business Administration, Business Information Systems, Computer Science, Finance, Management, Marketing, and/or Human Resource Management.

Minor in Managerial Economics. The requirements for a minor in Managerial Economics are Econ 200, 201, 400, 401; plus an additional 9 credits from: Econ 403, 504, 520, 521, 530, 531, 532, 533, 535, 551, 554, 585. Students must earn a GPA of at least 2.2 in these courses.

Bachelor of Arts (BA) Degree in Economics

Students may qualify to graduate with a BA rather than a BS degree in Economics by completing the requirements listed above in one of the areas of emphasis of Economics, and by meeting the University foreign language requirements for a BA degree, as set forth in this catalog.

Dual Major in Agribusiness, Agricultural Economics, or Economics

Students may pursue a dual major in Agribusiness, Agricultural Economics, or Economics while, at the same time, completing their first major in some other department. For these degrees, students must complete the same prespecialization (not including Econ 100) and additional courses as listed above, and must meet the same minimum GPA requirements. Some of these requirements may be met while completing requirements for their first major.

Second Bachelor of Science Degree in Agribusiness, Agricultural Economics, or Economics

Students may pursue a second Bachelor of Science degree in Agribusiness, Agricultural Economics, or Economics after receiving their first Bachelor of Science degree. For a second Bachelor of Science degree, students must complete the same prespecialization requirements (not including Econ 100) and additional courses as listed above, and must meet the same minimum GPA requirements. Some of these requirements may be met while completing requirements for their first degree. The second Bachelor of Science program must always include a minimum of 45 credits.

Financial Support

The Department of Economics, the College of Agriculture, and the College of Business award scholarships in addition to those available through the University Financial Aid Office. Information and application forms may be obtained from the department office.

Graduate Study

The department offers Master's degrees in economics and agricultural economics and the PhD in economics. These are open to students with or without undergraduate majors in economics or agricultural economics, although some prerequisites exist. The programs are designed to prepare the student in economic theory and provide depth in an area of specific interest.

See the *Graduate Catalog* for additional information on graduate programs.

Center for Economic Education. The Center for Economic Education has the responsibility for strengthening economic offerings and teaching effectiveness at the elementary, secondary, and college levels. It is involved in training teachers, consultation, and research in economic education. The center works closely with the College of Education, the Extension Services, other state centers, and the Joint Council on Economic Education—the national organization.

Economics Research Institute. The Economics Research Institute sponsors economic research and assists in the preparation of applications for research funds from outside agencies. It also acts as a clearinghouse for research materials and counsels researchers on techniques. In addition, the institute sponsors seminars on economic topics and finances the visits of off-campus economic authorities.

Economics Courses

100. Business Orientation. Orients freshmen and transfer students to College of Business programs, academic and student services, professional organizations, and career possibilities. (1F,W,Sp)

SS (AI) 200. Economics I. Designed for any student. Principles and institutions underlying operation of the economic system. Emphasis on government policy for reducing unemployment and inflation. (5F,W,Sp,Su) ©

SS 201. Introduction to Microeconomics. Designed for any student. Economics of the marketplace, analysis of issues surrounding our business and consumer institutions. Prerequisite: Econ 200. (3F,W,Sp,Su) ©

225. Introductory Internship. Introductory-level experience in internship position approved by the department. One credit for 75 hours of experience. Maximum of 6 credits applicable to graduation requirements. Sophomore standing. (1-6F,W,Sp,Su) ®

303. Livestock/Crop Marketing. Discussion of introductory marketing concepts as related to agricultural commodities. (3W)

304. Farm and Agribusiness Management. Economic concepts as applied to production agriculture and agribusiness. (3F)

325. Discussions with Business Leaders. Examines new methods for improving U.S. competitiveness by attending the Partners Program seminar sessions and hosting visiting executives from top U.S. companies. Repeatable to a maximum of 6 credits. (1F,W,Sp,Su) ®

331. Agribusiness Accounting. Students set up an agribusiness accounting system on a microcomputer, enter transactions, prepare financial statements and budgets, and make cash flow and enterprise analyses. Prerequisites: Acct 201, and BIS 140 or ASTE 309. (3W)

340. International Economics for Business. Primary issues in international economics as applied to contemporary business problems. Topics include trade patterns and policies, capital markets, and technology transfer. Prerequisites: Econ 200 and 201. (3F,W,Sp,Su)

390. Independent Research and Reading. (1-5F,W,Sp,Su) ®

400. Business Fluctuations and Forecasting. Macroeconomic analysis applied to forecasting and understanding fluctuations in the levels of income, employment, and production. Designed for undergraduate business and accounting majors. Prerequisite: Econ 200, Stat 230 or its equivalent, or consent of instructor. (3F,W,Sp,Su)

401. Managerial Economics. Microeconomic principles applied to economic decision-making and policy formulation with emphasis at the level of business firm and the individual consumer. Designed for undergraduate business and accounting majors. Prerequisite: Econ 201, Math 215 or its equivalent, or consent of instructor. (3F,W,Sp,Su)

402. Production Agriculture Management. Principles and practices associated with the successful operation of farms and ranches. Prerequisites: Econ 201 or 304; Econ 331 or Acct 201; or consent of instructor. (3F)

403. Agribusiness Finance. Financial considerations in organizing and operating farms, ranches, and agribusiness firms. (3W)

425. Advanced Internship. Midmanagement level experience in position approved by department. One credit for each 75 hours of experience. Maximum of 6 credits applicable to graduation requirements. Junior standing required. (1-12F,W,Sp,Su) ®

485H. Senior Honors Seminar. Presentation of senior thesis project created in the 495H course. Focus is on scholarly approach, problem definition, and methodology. (1Sp)

495H. Senior Honors Thesis. Creative project that will then be written up as a Senior Thesis as required for an Honors Plan. (3-9Sp)

500. Macroeconomics. Analysis of the underlying causes of unemployment, economic instability, inflation, and economic growth. Prerequisite: Econ 200 or consent of instructor. (4F,Sp,Su)

501. Microeconomics. Analysis of the behavior of consumers and business firms. Application of theory to the solution of real world problems. Prerequisite: Econ 201, Math 215 or its equivalent, or consent of instructor. (4F,W,Su) ©

502. Public Policy for Agriculture. A study of agricultural policies and their impacts on product and factor markets, with major focus on an economic analysis of public policy actions. (3Sp)

503. Agricultural Marketing. Principles and functions of marketing as applied to agriculture. Prerequisite: Econ 201 or 303. (3F)

504. Applied Price Analysis. Concepts and applications of price forecasting and contract trading. Prerequisite: Econ 201 or 303. (3F)

510. History of Economic Thought. Origin and development of economic theories of leading thinkers in western civilization from 1750. Prerequisites: Econ 200 and 201. (3W)

511. Economic History of the United States. Development of agriculture, industry, transportation, and finance from colonial times. Prerequisites: Econ 200 and 201. (5W)

***513. Economic History of Russia.** Development of the Russian economy from earliest times to 1930, emphasizing the interaction between economic forces and policies of the state. Prerequisites: Econ 200 and 201. (3Sp)

515. Comparative Economic Systems. History, economic theories, and comparative policies of communist, socialist, and capitalistic economies. Prerequisites: Econ 200 and 201. (3Sp)

****516. Economic Transformation of Russia and Eastern Europe.** Description and analysis of the contemporary economic systems of Russia and Eastern Europe with emphasis on problems of economic policy and central planning. (3Sp)

520. Introduction to Labor. A review of the development of labor-management relationships and the growth of trade unionism in the United States. (3F)

521. Industrial Relations and Collective Bargaining. A comprehensive study of the bargaining process and scope of labor-management contracts, the day-to-day administration of agreements, and the major substantive issues in negotiations. (3W,Sp)

522. Labor Force Analysis and Manpower Economics. Labor force development and behavior, occupational choice and mobility, human capital formation, labor market information and institutions, and manpower policies. (3W)

***523. Trade Unionism and the Law.** A survey of the law governing labor relations. The legal framework in which the collective bargaining relationship is established and in which negotiations take place is analyzed. (3Sp)

****524. Economics of the Cooperative and Worker-Owned Enterprise.** Provides the student with an understanding of the structure and functioning of industrial cooperatives and other types of worker-owned enterprises in the U.S. and abroad. (3Sp)

530. Business and Government. Description and analysis of government-business interaction: antitrust, price and entry regulation, consumer protection, government enterprise, patents, price controls. Prerequisite: Econ 201. (3Sp)

531. Applied Mathematical Economics—Optimization. Economic applications of basic mathematics, including algebra and calculus (differentiation and integration). Prerequisite: Math 215 or equivalent. (3F)

532. Economic Applications of Matrix Algebra. Economic applications of matrix algebra (input-output models and linear and nonlinear programming). Prerequisite: Econ 531 or its equivalent. (3W)

533 (d633).[1] Applied Econometrics. Application of basic statistics, simple linear regression, multiple regression, and simultaneous equations to economic models.

Prerequisites: Econ 531 or its equivalent; Stat 230, or Stat 301 and 502, or their equivalent; or consent of instructor. (3F)

535. Agribusiness and Cooperatives Management. Applications of economic and management principles to farm marketing and supply firms. Management teams operate computer simulated farm supply firms in competition with each other. Prerequisite: Econ 201 and Acct 201; or consent of instructor. (3Sp)

540. International Trade and Finance. Issues in intermediate international trade and finance, including noncompetitive trade theory, trade policy, and exchange rate analysis. Prerequisites: Econ 340, and Econ 401 or 501. (4W)

550. Public Finance. Government fiscal institutions-expenditure programs, budget procedures, tax systems, debt issues, levels of government, and the issues surrounding their operations. Prerequisite: Econ 401 or 501. (3F)

551. State and Local Finance. Unique financial problems of state and local governments. (2W)

554. Guide to Benefit Cost Analysis and Interpretation. Terminology, data arrangement, economic and financial considerations required in preparation of project feasibility and funding documents. Lecture plus workshop format. (3W)

556. Natural Resource Economics. Economics of developing, managing, and conserving natural resources. Topics include resource use and conservation, environmental quality, public and private resource management, and valuation of nonmarket goods. Prerequisite: Econ 401 or 501. (3F)

560. Money and Banking. Development of our present monetary and banking system; a critical analysis of central banking. Prerequisite: Econ 400 or 500 or consent of instructor. (4Sp)

566 (d666). Training and Organizational Development. Theoretical basis for training and development in organizations. Practical experience in the design and development of training and other educational programs in an organizational setting. For graduate students. (3Sp)

580. Economics of Less Developed Countries. Theories of economic development, characteristics, and problems of less developed and developing countries, alternative techniques and policies for the promotion of growth and development. (3F)

***585. Regional and Urban Economics.** Building on microeconomic theory, models for regional and urban structure and change are explored. Policy decision models are also developed. Prerequisites: Econ 401 or 501, or consent of instructor. (3F)

595. Senior Agricultural Economics/Economics Project. A current problem related to agricultural economics and/or economics is identified and analyzed, bringing together other agricultural economics and economics course concepts and methods. Prerequisites: Econ 400 or 500, and Econ 401 or 501. (3Sp)

Graduate[2]

600. Income Theory. Prerequisites: Econ 500 or consent of instructor and applied calculus, Econ 531 or its equivalent. (4F)

601. Price Theory I. Prerequisites: Econ 501 and 531 or their equivalent, or consent of instructor. (4F)

602. Price Theory II. Prerequisite: Econ 601. (4W)

603. Agricultural Marketing and Policy. Prerequisite: Econ 501 or consent of instructor. (3Sp)

604. Dynamic Macroeconomics. Prerequisite: Econ 600 or consent of instructor. (4W)

606. Research Methods. (3W)

608. Theory and Methods of Community Economic Development. (3Sp)

609. Community Economic Development Project and Seminar. (3Su)

625. Graduate Internship. (1-6F,W,Sp,Su) ®

626. Economics of New Work Systems. (3F)

631. Advanced Mathematical Economics. Prerequisites: Econ 500, 501, and 531, or their equivalent; or consent of instructor. (3F)

633 (d533). Applied Econometrics. Prerequisites: Econ 531 or its equivalent; Stat 230, or Stat 301 and 502, or their equivalent; or consent of instructor. (3F)

640. International Economics. Prerequisite: Econ 540 or consent of instructor. (3F)

643. Econometrics I. Prerequisites: Econ 531, Stat 230, or Stat 301 or 502 or their equivalent, or consent of instructor. (3W)

644. Econometrics II. Prerequisite: Econ 643 or consent of instructor. (3Sp)

645. Operations Research. Prerequisites: Econ 531 and 532; BA 308 or equivalent; or consent of instructor. (3Sp)

647. Business Forecasting Methods. Prerequisite: Econ 644 or equivalent, or consent of instructor. (3F)

656. Resource Economics. Prerequisites: Econ 501, 531, or their equivalent, or consent of instructor. (3F)

666 (d566). Training and Organizational Development. (3Sp)

680. Economic Development. Prerequisite: Econ 580 or consent of instructor. (3W)

690. Readings and Conference. (1-5F,W,Sp,Su) ®

691. Independent Research. (1-5F,W,Sp,Su) ®

692. Graduate Seminar in Economic Studies. (1F) ®

697. Thesis. (1-12F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-3F,W,Sp,Su) ®

700. Advanced Macroeconomics Seminar. Prerequisites: Econ 601 or consent of instructor. (3Sp) ®

701. Price Theory I. Prerequisites: Econ 601, 631, or their equivalent, or consent of instructor. (3Sp)

720. Topics in Applied Microeconomics. Prerequisites: Econ 700, 701, and 733, or consent of instructor. (3W)

733. Advanced Econometrics Seminar. Prerequisite: Econ 647 or consent of instructor. (3W) ®

755. The Economics of Natural Resource Use Seminar. Prerequisites: Econ 601, 631, 656, or their equivalent, or consent of instructor. (3W) ®

760. Seminar in Financial Topics. (3Sp) ®

780. Economic Development/Trade Seminar. Prerequisites: Econ 640 and 680. (3Sp) ®

797. Dissertation Research. (1-12F,W,Sp,Su) ®

799. Continuing Graduate Advisement. (1-3F,W,Sp,Su) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

*Taught 1996-97.

**Taught 1997-98.

Department of

Electrical and Computer Engineering

College of Engineering

Head: Professor Richard W. Harris
Office in Engineering Laboratory 149, 797-2840

Professors Doran J. Baker, Kay D. Baker, Joe R. Doupnik, Robert W. Gunderson, Ronney D. Harris, Linda S. Powers, Alan W. Shaw, Allan J. Steed, Gardiner S. Stiles, Ronald L. Thurgood (Assoc. Dean, College of Engineering); **Research Professors** David A. Burt, James C. Ulwick; **Adjunct Professors** Stephen E. Bialkowski, Douglas M. Chabries, Boyd P. Israelsen; **Professors Emeritus** Clayton Clark, Bertis L. Embry, William L. Jones, L. Rex Megill, Bruce O. Watkins, Clair L. Wyatt; **Associate Professors** John C. Kemp, Paul A. Wheeler; **Research Associate Professors** J. Steven Hansen, Ronald J. Huppi; **Associate Professor Emeritus** Duane G. Chadwick; **Research Associate Professor Emeritus** Earl F. Pound; **Adjunct Associate Professors** Lloyd G. Allred, Wynn C. Stirling, Gene A. Ware; **Assistant Professors** Ben A. Abbott, Scott E. Budge, Todd K. Moon, Charles M. Swenson; **Research Assistant Professors** Paul D. Israelsen, Larry L. Jensen, Stephen B. Turcotte; **Adjunct Assistant Professor** Chien-Min Huang; **Adjunct Research Assistant Professor** L. Carl Howlett

Degrees offered: Bachelor of Science (BS), Master of Engineering (ME), Master of Science (MS), Master of Engineering Science (MES), Electrical Engineer (EE), and Doctor of Philosophy (PhD) in Electrical Engineering

Objectives

The Department of Electrical and Computer Engineering offers a balanced curriculum of classwork, laboratory work, and design experiences to prepare students for careers as practicing engineers. The Bachelor of Science program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET). The research program of the department, which includes undergraduates as well as graduate students, is internationally acclaimed in the field of aerospace instrumentation and measurements.

The overriding goal of the electrical and computer engineering curriculum is to integrate mathematics, science, engineering, and computer skills, along with communication and social skills, to enhance the productivity and creativity of the engineer. Engineering design, including open-ended problems, is included throughout the curriculum and concludes with a major engineering design experience, which also requires both verbal and written communication skills. Studies in the humanities and social sciences serve not only to meet the objectives of a broad education, but also to meet the objectives of making engineers fully aware of their social responsibilities and better able to consider related factors in the decision making process.

The electrical and computer engineering program gives each student a solid foundation in electricity, electronics, computers, communications, energy, and systems, with individual practical experience. Upon this basic foundation the student then builds expertise in advanced areas, stressing actual design practice to prepare him or her for a productive engineering career. The electrical and computer engineering program can be categorized into the following areas: analog and digital electronics, computer engineering, controls, digital and signal processing, communications, and microwave engineering.

Digital and computer engineering is a rapidly expanding application area involving logic circuits, computer architecture and design, microcomputer systems, data communication networks, digital control systems, robotics, design automation, and software engineering. The Electrical and Computer Engineering Department offers an excellent program option in digital and computer engineering, which includes minors in computer science and mathematics. For details about this option, contact the department or the college academic adviser.

Specific departmental goals for the next five to ten years are stated as follows: (1) foster and develop meaningful interaction with students, providing an atmosphere giving them meaningful academic, professional, and life experiences; (2) provide students with the highest quality instruction and education in the fundamentals of electrical and computer engineering, emphasizing "hands-on" practical and real-life laboratory experiences; (3) maintain contact with alumni and industrial partners to ensure that the academic curriculum is responsive to societal needs; (4) provide relevant and meaningful design experiences in hardware (both digital and analog) and software, beginning with design emphasis in a freshman course and proceeding to a capstone design experience in the year-long senior design courses; and (5) strive, as faculty members, to be examples of professional electrical and computer engineers, with outstanding ethical standards, showing concern for and nurturing students, while helping strengthen the engineers of the future.

In cooperation with other departments, all ECE students are encouraged to complete one or more minors in computer science, mathematics, physics, or other appropriate fields of interest to the student. Dual degrees are also available with many of these departments.

Requirements

Prior to entry into the upper-division classes, the student must meet the standards for entry into the Professional Engineering Program. Additional information concerning these items is given in the College of Engineering write-up. It is the responsibility of the student to be aware of these rules and procedures; however, adviser assistance is available.

Bachelor of Science. The program leading to a Bachelor of Science in electrical and computer engineering is nominally a

four-year program. The required program consists of a basic foundation of mathematics, science, computer science, engineering fundamentals, and laboratory and design experiences. Advanced elective courses that provide for one or more areas of specialization, technical communication skills, and general education complete the program and prepare the student for a productive and rewarding career in the electrical and computer engineering profession.

Required courses are shown in the accompanying paragraphs; however, because of differences in high school or transfer student preparation, it is strongly recommended that students meet with the college academic adviser to plan a detailed quarter by quarter schedule for completing the preprofessional requirements. Particular attention must be paid to course prerequisites, requiring some students to take longer than six quarters to complete the preprofessional program. Students transferring into the department should consult with the college academic adviser for transfer credit evaluation and proper placement in the curriculum.

AP and CLEP credit can be used to meet some of the required technical and General Education courses.

Some of the junior classes can be delayed until the senior year, but this will limit a student's choice of electives during his or her senior year. Details concerning courses acceptable as ECE and technical electives are available from the Electrical and Computer Engineering Department.

Preprofessional Program

Freshman Year: Math 220, 221, 222; CS 170, 171, 172; Chem 121; Phyx 221; Engr 187; ECE 188; Engl 101; and General Education electives.

Sophomore Year: Math 320, 321, 322; Phyx 222, 223; ECE 211, 212, 272, 273; Engl 201; and General Education or technical electives.

Professional Program

Junior Year: ECE 308, 310, 311, 312, 313, 314, 315, 346, 347, 375, 376, 377, 391, 392; and Econ 200.

Senior Year: ECE 401, 477, 480, 491, 492; 12-21 credits ECE electives; 6-15 credits engineering science electives; 5-14 credits of math and science electives; and 0-9 credits of other technical electives, for a total of 32 credits of technical electives.

Student Research Opportunities

The academic disciplines are given meaningful application as part of the University's commitment to human, atmospheric, water, energy, and ecological resources, and to the exploration of space. Numerous motivated students, undergraduate as well as graduate, are given exciting hands-on experience on projects, such as working with instruments being flown on the Space Shuttle. USU's world famous space program was spawned by the Electrical and Computer Engineering Department. Programs are also active in digital systems, robotics, artificial intelligence, computer and communication networks, optics, large-scale integrated circuits, and computer-aided teaching and design.

Several research units are associated with the Electrical and Computer Engineering Department. The Center for Space Engineering conducts research primarily in infrared energy measurements and advanced instrumentation development and performs rocket and satellite measurements of upper atmospheric and space phenomena. The Center for Atmospheric and Space Sciences performs theoretical analyses and carries out experiments in the study of the physics and chemistry of the terrestrial atmosphere and magnetosphere and of the solar system. Image compression is currently a major focus in the department. Graduate students have opportunities in developing algorithms, VLSI chips, and printed circuit subsystems for use in image compression systems. The digital systems laboratory conducts undergraduate and graduate research in the development of digital systems with emphasis upon microprocessor applications. The Utah Water Research Laboratory, the Biological and Irrigation Engineering Department, and the Electrical and Computer Engineering Department are active in high-tech water resource management.

Graduate Study

The Department of Electrical and Computer Engineering offers the following degrees: Master of Engineering (ME), Master of Science (MS), Master of Engineering Science (MES), Electrical Engineer (EE), and Doctor of Philosophy (PhD) in Electrical Engineering. See the *Graduate Catalog* for information on these programs.

Electrical and Computer Engineering Courses

188. Engineering Orientation and Computer Applications. Orients students to College of Engineering programs, academic advising, student services, professional societies, and engineering careers. Laboratory activities emphasize writing and computer applications. Prerequisites: Math 106 and keyboarding at 25 wam. (1W,Sp)

211, 212. Electrical Circuits. Basic electrical quantities and components, Ohm's Law, Kirchoff's Laws, network theorems, loop and nodal methods, DC, AC, and transient analysis. Develops skills in laboratory measurements and instruments. Three lectures, one lab. Prerequisite: Phyx 222. Math 322 must be taken concurrent with ECE 212. (4W,Sp) (4F,W,Su)

225. Introductory Internship/Co-op. An introductory-level planned work experience in industry. Detailed program; must have prior approval. Written report required. (3F,W,Sp,Su) ®

IO 260. Science of Sound. Introduction to sound and its uses: Physical basis of sound, perception of sound, musical sound production, electronic sound reproduction, room acoustics, environmental noise. Prerequisite: Math 101. (5Sp)

270, 271. Electronic Systems. Analog and digital electronic circuits and systems. Introduction to microcomputers. Instrumentation, measurements, and control applications. Not for ECE majors. Three lectures, one lab. Prerequisite: Phyx 223 or concurrent registration. (4W,Sp) (4Sp)

272, 273. Digital Circuits. Digital and microcomputer fundamentals, discrete signals, number systems, codes and arithmetic logic operations, analysis and design of combinational and sequential logic circuits. Three lectures, one lab. Prerequisite: computer literacy. (4F,Sp) (4F,W)

308. Electrical Energy Systems. Multiphase AC systems, fundamentals of electromagnetic energy generation, control, and conversion. Introduction to machinery, power transducers, and transformers. Prerequisite: ECE 211. (3W,Su)

310, 311, 312. Signals, Circuits, and Systems. Analysis of discrete and continuous signals in linear circuits and systems. Fourier, Laplace, and Z transforms, sampling theory. Applications in circuits, communication, and control systems. Prerequisite: ECE 212. (3F) (3W) (3Sp)

313. Systems. System models, block diagrams, signal flow graphs, and feedback concepts. Time domain and transform domain methods of system analysis. Three lectures, one lab. Prerequisite: ECE 310. (4Sp)

314, 315. Electromagnetics. Electromagnetic forces and fields, charge and current distributions, Maxwell's equations, electromagnetic energy and power, electromagnetic waves, radiation, propagating waves, transmission lines, waveguides, and antennas. Three lectures, one lab. ECE 314 must be taken before ECE 315. (3F) (3W)

316. Electromagnetics for Computer Engineering. High frequency electromagnetic principles and applications in the analysis and design of high-speed computers and computer networks. (3Sp)

342. Network Basics. Detailed analysis of local area network transmission lines, Ethernet hardware controllers, and real-time packet handling software. Prerequisite: ECE 376. (3W)

346, 347. Electronic Analysis and Design. Introduction to semiconductors, diodes, transistors, amplifier circuits, operational amplifiers, and integrated circuits. Three lectures, one lab. Prerequisite: ECE 212. (4W) (4Sp)

375. Seminar. Weekly meeting of undergraduate students with faculty and representatives from industry to promote professionalism and prepare students for an engineering career. Repeatable with 2 credits required for graduation. *P/D+, D, F* grading. (1F,Sp) ®

376. Microcomputers. Microprocessor architectures, instruction sets, and assembly language programming with emphasis on software design techniques. Three lectures, one lab. Prerequisites: ECE 273, CS 171. (4F,Sp)

377. Microcomputer Systems. Synthesis of microcomputer systems, and analysis of microcomputer system components and interfacing to peripherals, including signal requirements such as loading, timing, and interrupts. Three lectures, one lab. Prerequisite: ECE 376. (4W,Su)

378. Engineering Software Design. Methods and tools to develop sound software for engineering controls and instrumentation applications. Prerequisite: ECE 376. (3Sp)

391. Introduction to Design. Preparation for senior design projects and writing and oral presentation of an individual project proposal. Prerequisite: Upper-division standing. (2F,W,Sp,Su)

392. Design I. Individual or team engineering project, including design, development, and testing. Written reports required. Prerequisite: ECE 391 and senior standing. (2F,W,Sp,Su)

401. Probability for Signals and Systems. Introduction to analysis of random signals and systems. Covers basic probability, single and multiple random variables, distribution functions, functions of random variables, and practical computer methods. Prerequisite: ECE 312. (3Sp)

425. Advanced Internship/Co-op. A planned work experience in industry. Detailed program; must have prior approval. Written report required. (3F,W,Sp,Su) ®

463. Electricity and Magnetism. Electromagnetic phenomena as it applies to statics, dynamics, and circuits. Prerequisite: Phyx 462. (3Sp)

477. Digital System Design. Digital system design using a top down-bottom up approach. Use of CAE tool for design capture and simulation. HDL programmable devices stressed. Prerequisite: ECE 377. (4F,Sp)

480. Applied Electronics. Electronic devices and circuits for instrumentation, communication, control and power applications. Three lectures, one lab. Prerequisite: ECE 347. (4F)

491. Design II. Individual or team engineering project, including design, development, and testing. Written reports required. Prerequisite: ECE 392 and senior standing. (2F,W,Sp,Su)

492. Technical Reporting. Written and oral reports describing technical details of design project. Prerequisite: ECE 491. (2F,W,Sp,Su)

493. Special Studies for Undergraduates. Independent or group study of engineering problems not covered in regular course offerings. (1-5F,W,Sp,Su) ®

506. VLSI Design Techniques. Basic course in microcircuit design, modeling, and simulation. Computer-aided analysis for VLSI design and verification. Study of NMOS and CMOS processes. Prerequisites: ECE 477 and 480 concurrently. (3F)

510, 511. Control Systems. Analysis and design of control systems. Transfer function and state space techniques in the engineering of continuous and discrete control systems. Three lectures, one lab. Prerequisite: ECE 313. (4F,Su) (4W)

515. Operating Principles, Dynamics, and Modeling of Control Actuators. Operating principles, static and dynamic characteristics, modeling, and application of electrical motors as control actuators. Introduction to basic physical principles of control sensors. Prerequisites: ECE 308 and 313. Three lectures, one lab. (4Sp)

525. Spacecraft Avionics and Telemetry Systems. Spacecraft electrical and electronics subsystems, i.e., guidance, navigation, and control; communications; command and data handling; electrical power generation and storage; and special requirements of the space environment. Three lectures. Prerequisites: ECE 211 and 272, or ECE 270 and 271. (3W)

***528. Electronic Music Systems Engineering.** Engineering analysis and design of electronic music systems. Includes acoustics of musical instruments, analog and digital synthesizers, and MIDI protocols. Three lectures, one lab. (4F)

****529. Sound System Design.** Sound system design based on engineering principles. Includes measuring parameters in the acoustic environment, designing the power amplification system, and selection of microphones and loud speakers. Three lectures, one lab. (4F)

540, 541. Microwave Electronics. Circuit parameters and design techniques for distributed circuits, active and passive microwave devices. Three lectures, one lab. Prerequisites: ECE 315 and 347. (4W) (3Sp)

542. Antennas and Radiation. Theory and applications of electromagnetic radiation and radiative structures. Three lectures, one lab. (4)

550. Digital Signal Processing. Theory and principles of digital signal processing, including discrete-time signals and systems, Z-transforms, Fourier analysis, FIR and IIR digital filters, and discrete Fourier transforms. Prerequisite: ECE 312. (4F,Su)

551. Real-time Digital Signal Processing. Applications of DSP principles using real-time processors. Includes C and assembly language programming, modern DSP processor architecture, and finite word-length effects. Laboratory includes implementation of a hardware-based real-time system. Prerequisite: ECE 550. (4Sp)

554. Communication Systems. Engineering of analog and digital communication systems. Signal analysis, modulation-demodulation, channel properties, and introduction to communication standards and protocols. Prerequisite: ECE 312. Three lectures, one lab. (4F)

564. Solid-state Materials-devices. Modeling of electrical and electromagnetic characteristics of solid-state semiconductor materials. Operating principles of semiconductor and optical solid-state devices used in electrical engineering. Prerequisites: ECE 314 or Phyx 461, Math 322. (3W)

574. Computer and Data Communication Systems. Provides a systems approach to computer and data communication. Includes data transmission, computer interfaces,

and protocols relating to local and wide area networks. Three lectures and one lab. Prerequisite: ECE 377. (4Sp)

576. Memory, Storage, and Bus Systems. Memory hierarchy: cache, main memory, and virtual memory; storage systems; busses. Performance analysis, implications for system and applications software. Prerequisite: ECE 377. (3F)

577. Microcomputer Interface Design. Design of hardware and software interfaces to microcomputers for instrumentation and control applications. Three lectures, one lab. Prerequisite: ECE 377. (4Sp)

578. Introduction to Real-Time Systems. Issues concerning implementation of real-time systems, including synchronous programming, time, interrupts, context switch, semaphores, threads, message passing, and scheduling. Prerequisite: ECE 376. (3W)

579. Multiprocessor Systems Engineering. Low-level programming for small shared-memory and distributed-memory multiprocessor systems. Stresses hardware-software interaction and support for sharing resources and message-passing. Prerequisite: ECE 377. (3Sp)

581. Applied Electronics. Electronic circuits and systems analysis and design of integrated circuit devices. Three lectures, one lab. Prerequisite: ECE 480. (4W)

592. Teaching Engineering. Teaching principles, techniques, and laboratory experience in engineering. Instruction and experience in teaching engineering lectures, recitation, and laboratory sections. One scheduled session per week with other sessions arranged. Prerequisite: department head approval. (1-3F,W,Sp,Su) ®

593. Special Topics in Electrical Engineering. Independent or group study of engineering problems not covered in regular course offerings. (1-5F,W,Sp,Su) ®

Graduate[1]

601. Stochastic Processes in Electronic Systems. (3F)

607, 608. Very Large Scale Integrated Circuit Design. (4W) (3Sp)

***611, *612. Optical Engineering.** (3W) (3Sp)

620, 621, 622. Microwave Engineering. (3W) (3Sp) (3)

625. Graduate Internship/Co-op. (3F,W,Sp,Su) ®

***631. Space Science and Engineering.** (3W)

640, 641. Computer Networking. (4F) (4W)

642. Analog VLSI Design. Prerequisites: ECE 506 and 581. (3)

650. Digital Image Processing. (3W)

652, 653. Control Theory. (3F) (3W)

****657, ****658, ****659. Applied Plasmadynamics.** See Phyx 657, 658, 659. (3F) (3W) (3Sp)

661, 662. Electromagnetics. (3F) (3W)

680. Electrical Engineering Colloquium. (1F,W,Sp) ®

687, 688. Computer Structure. (3W) (3Sp)

693. Special Topics in Electrical Engineering. (1-5F,W,Sp,Su) ®

695. Design Project. (3F,W,Sp,Su)

697. Thesis Research, MS. (1-9F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

701, 702, 703. Aeronomy. (3) (3) (3)[2]

704. Ionospheric Physics. See Phyx 704. (3)[2]

706. Circulation of the High Atmosphere. See Phyx 706. (3)[2]

***711, 712. Electro-optics.** (3) (3)[2]

732. Space Science and Engineering. (3Sp)

742, 743. Design and Analysis of Advanced Integrated Circuits. (3) (3)[2]

750. Advanced Digital Signal Processing. (3W)

751. Advanced Digital Image Processing. (3Sp)

752, 753. Advanced Control Theory. (3Sp) (3Sp)[2]

764, 765. Digital Computer Architecture. (3) (3)[2]

770, 771. Communications and Signal Processing Theory. Prerequisite: ECE 601 must be taken prior to ECE 770. (3Sp) (3F)[2]

793. Special Problems in Electrical Engineering. (1-9F,W,Sp,Su) ®

797. Dissertation Research. (1-16F,W,Sp,Su) ®

799. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

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[1]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

[2]Taught on demand.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

*Taught 1996-97.

**Taught 1997-98.

Department of

Elementary Education

College of Education

Head: Professor Jay A. Monson
Office in Emma Eccles Jones Education 385A, 797-0385
Advisement Center in Emma Eccles
Jones Education 373, 797-0373

Professors Deborah A. Byrnes, Donald R. Daugs, Bernard L. Hayes; **Associate Professors** Gary L. Carlston, Francine F. Johnson, John A. Smith, Deanna D. Winn; **Assistant Professors** James J. Barta, Martha T. Dever, James T. Dorward, Deborah E. Hobbs, Scott L. Hunsaker, Elizabeth J. Jared, Martin K. Tadlock; **Student Teaching/Field Experience Coordinator** Kathleen O. Johnson; **Advisers** Sheri N. Noble, Sylvia Robinson, Mary Ann Warren; **Adjunct Instructors** Dorothy Dobson, Prent Klag, Kaye Rhees; **Temporary Instructor** Judy H. Greene; **Temporary Lecturer** Gloria J. Bell

Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA), Master of Science (MS), Master of Arts (MA), and Master of Education (MEd) in Elementary Education; BS and BA in Early Childhood Education; participates in interdepartmental Doctorate of Philosophy in Education (PhD) and Doctorate of Education (EdD)

Objectives

The purposes of the Department of Elementary Education are (1) to develop professional educators and (2) to advance knowledge in the field of education. These purposes are realized through teaching, scholarly activities, and service. The department provides leadership in the preparation of teachers, supervisors, curriculum specialists, and other professional personnel for careers in elementary education, early childhood education, and middle education.

The Department of Elementary Education at Utah State University offers three programs leading to certification as a teacher. (1) Elementary education: this program offers certification to teach in grades one through eight in the public schools. (2) Early childhood education: this program offers certification to teach prekindergarten, kindergarten, and grades one through three in the elementary school. (3) Middle education: this program offers an endorsement to teach in grades five through eight.

Requirements

Departmental Entrance Requirements. Students who wish to be admitted to the Department of Elementary Education must have an overall grade point average of 2.75. Successful completion of the PPST (Pre-Professional Skills Test) is also required. After completing at least 45 credits, the student should apply for admission to the teacher education program (see page 44). A minimum GPA of 2.75 is also required to remain in good standing and to graduate from the program.

Elementary Education SODIA Program. The acronym SODIA represents the elementary teacher education program. The name is derived from the initial letter of descriptive words (Self, Others, Disciplines, Implementation, and Application) which represent emphasis placed at each level of the program.

The elementary education SODIA program is performance-based and field-centered. It utilizes public schools as partners in each phase of the teacher education program. SODIA is an interdisciplinary and interdepartmental program utilizing staff members from the Departments of Psychology, Special Education and Rehabilitation, Family and Human Development, Health, Physical Education and Recreation, Music, Art, and Instructional Technology who work in conjunction with the Department of Elementary Education. These University faculty members work with teachers and principals of cooperating public schools and the Edith Bowen Laboratory School on the USU campus in an integrated program.

Level I, Self, is represented by the "S" in the acronym SODIA. This is the first-level course introducing the field of education and emphasizing the student's self-understanding in relation to ability and desire to teach. A minimum of 10 hours are spent observing in an elementary or middle school classroom.

Level II, Others, is represented by the "O" in the acronym SODIA. This stands for the many "others" who make up the education community. In this bloc, students receive 15 credits and are assigned as a teacher assistant in one of the public schools. The remainder of the time is spent in seminars and classwork offered on the USU campus.

Level III, Disciplines, is represented by the "D" in the acronym SODIA. Students in this bloc receive 15 credits and are assigned to classroom and seminar experiences at the Edith Bowen Laboratory School or a nearby public school. The "methods" courses in reading, social studies, language arts, and mathematics are included in this bloc. A five-credit science methods course and a preliminary course in reading are required as a transition from Level II to Level III.

Level IV, Implementation, is represented by the "I" in the acronym SODIA. This is the student teaching or internship phase of the program. Student teaching constitutes full days of actual teaching experience for the full quarter. Internships are for the full academic year.

Level V, Application, is represented by the "A" in the acronym SODIA. At this level, graduates of the program make a transition into the profession of teaching.

In the fall of 1992, the department faculty reaffirmed the adoption of the SODIA model and initiated the development of Program Strands to receive emphasis through SODIA's levels of progression. These strands are: (1) Assessment, (2) Classroom Management, (3) Curriculum, (4) Effective Teaching, (5) Learner, (6) Parent and Community, (7) Diversity, and (8) Personal and Professional Development. A student performance portfolio assessment process was also initiated.

Admission to the teacher education program is a prerequisite for enrollment in Level II. A student desiring admission to this program should file an application in the Teacher Education Office, located in room 103 of the Emma Eccles Jones Education Building.

All students majoring in elementary education must be registered in the College of Education. An adviser will be assigned from the Department of Elementary Education. Programs of professional education courses as well as areas of emphasis in subject matter have been developed by the Department of Elementary Education and approved by the Council on Teacher Education and the Utah State Office of Education. For a complete description of the program and requirements for graduation and certification, students should obtain a copy of the *Department of Elementary Education Student Program Planning Guidebook*, available from the USU Bookstore.

Each student completes a professional quarter of student teaching or a year of internship. An application for student teaching/internship must be made at least two quarters in advance and credentials are reevaluated at that time. Not all student teachers/interns can be accommodated by the schools located within Cache Valley. Students should be financially prepared to spend that time off campus in the event such an arrangement is necessary.

Students who carefully select their elective courses may also qualify for a special endorsement to the basic professional teaching certificate. All students complete an area of specialization in a subject matter field in addition to the teaching support minor. Dual certification endorsement programs exist in communicative disorders, early childhood education, special education, and middle education. Information concerning special endorsements and additional areas of specialization may be obtained from the Department of Elementary Education.

Students who have teaching certificates in areas other than elementary education may obtain the elementary certificate by meeting the same or equivalent requirements for certification expected of an elementary education major. Those desiring to acquire dual certification should work with an adviser from the Department of Elementary Education.

All courses listed as major subject courses must be taken on an *A-B-C-D-F* basis and the grade point average for these courses must be 2.75 or better; major subject courses passed with less than a *C* grade must be repeated.

For more information concerning requirements for University graduation and for basic professional teaching certification in elementary education, early childhood education, and middle education, see major requirement sheets available from the Elementary Education Department Advisement Center, Emma Eccles Jones Education 373.

Scholarship Information

The following scholarships are available to junior and senior students: Ballam, Bowen, Frye, Hales, Stewart, DeHart, Kurzhals, Jackson, Taylor, and Young. To be eligible, students must have completed Level II of the Elementary Education Program and have a cumulative GPA of 3.5 or higher. Applications are available from the Elementary Education Department and are due on March 1.

Graduate Study

The Department of Elementary Education, as an integral part of the College of Education, assists in the preparation of graduate students seeking the MEd, MA, and MS degrees, and the PhD or EdD degree. Students desiring information concerning the various graduate programs should consult with the department head and write to the School of Graduate Studies for a *Graduate Catalog* which contains the details on the various graduate programs. Application for admission to a graduate program is made through the School of Graduate Studies.

Elementary Education Courses

100. Orientation to Elementary Education—Level I. Students assess themselves as prospective teachers and have an opportunity to do observations in the public schools grades kindergarten through eighth. (3F,W,Sp)

301. Foundation Studies in Teaching—Level II. Examines and evaluates varying philosophies and basic principles of elementary or early childhood education. Students observe and participate in public school teaching activities. Prerequisite: admission to teacher education. (5F,W,Sp)

302. Practicum in Elementary Education—Level II. Credit for practicum work in the public schools in Level II of the preparation program. Advance application required. Prerequisite: admission to teacher education. (1-9F,W,Sp) ®

310. Teaching Reading. Considers stages of reading development, skills, attitudes, materials, methods of instruction, and experiences of children which contribute to achievement in reading. Prerequisites: admission to teacher education and Level II; must be taken prior to Level III. (3F,W,Sp,Su) ©

401. Teaching Science. Investigation and practical application of science programs, materials, techniques of instruction, and experiences to help children gain skills, understanding, and attjtudes in science. Prerequisites: admission to teacher education; completion of Level II; and Biol 101, Chem 101, Geol 101, and Phyx 120 or their equivalents; must be taken prior to Level III. (5F,W,Sp,Su)

402. Practicum in Elementary Education—Level III. Credit for practicum work at the Edith Bowen Laboratory School in Level III of the preparation program. Advance application required. (1-6F,W,Sp) ®

403. Teaching Language Arts—Level III. A study of language development in children and its implication for classroom practice in listening, speaking, writing, and reading. Prerequisite: admission to teacher education. (3F,W,Sp)

404. Developmental and Corrective Reading—Level III. Intended to give prospective teachers practical experience in implementing developmental reading programs and in diagnosing reading difficulties. Prerequisite: admission to teacher education and ElEd 310. (3F,W,Sp)

405. Teaching Social Studies—Level III. Organizing the elementary curriculum to provide social studies experiences consistent with the nature of the child and our democratic society. Prerequisite: admission to teacher education. (3F,W,Sp)

406. Teaching Mathematics—Level III. The place of mathematics in the elementary school curriculum; methods of instruction, evaluation, remediation, and enrichment. Prerequisite: admission to teacher education. (3F,W,Sp)

425. Advanced Cooperative Work Experience. Cooperative education work experience position; increased level of complexity and a more professional level of experience as student advances toward completion of the program. (1-15F,W,Sp,Su) ®

448. Early Childhood Education (K-3). Study of early childhood (K-3) curriculum, methodology, and learning environments. (5W,Sp)

450. Elementary Curriculum Seminar—Level IV. A weekly seminar taken concurrently with the professional quarter of student teaching or the first quarter of the internship. Consideration given to problems arising during the teaching experience and professional development as a teacher. Prerequisites: admission to teacher education and completion of Levels I, II, and III. (3F,W,Sp,Su)

460. Student Teaching in Elementary Schools—Level IV. Actual teaching experience in public school classrooms for a full quarter to provide in-depth

application of the total elementary program. Advance application required. (3-12F,W,Sp,Su)

465. Student Teaching in Early Childhood Education (Kindergarten). The student will be assigned to a cooperating teacher in a public school kindergarten. (3-6F,W,Sp,Su)

466. Student Teaching in Early Childhood Education (Gr 1-3). The student will be assigned to a cooperating teacher in a public school primary grade (1-2-3). (3-12F,W,Sp,Su)

468. Associate Teaching in the Elementary Schools—Level V. For undergraduates completing the internship program. (3-12F,W,Sp,Su) ®

490H. Senior Project. All honors students are required to submit a senior project for graduation from the Honors Program. Students work with a department adviser on a topic of their choice. (1-9F,W,Sp,Su)

497H. Senior Thesis. An in-depth paper or project culminating in a formal presentation. Required of all students for graduation from the Honors Program in Elementary Education. (1-9F,W,Sp,Su)

500 (d600).[1] Managing Student Behavior. Provides educators with theory and application of basic principles for responsible student behavior in school. (3F,W,Sp,Su)

590. Independent Study. (1-3F,W,Sp,Su) ®

Graduate[2]

600 (d500). Managing Student Behavior. (3)

604. Measurement and Evaluation in Education. (3W,Su)

615. Foundations of Curriculum Development. (3)

620. Improvement of Early Childhood Education. (3)

622. Workshop in Early Childhood Education. (1-6) ®

623. Early Childhood Methods and Curriculum. (3)

624. Workshop in Science Education. (1-6Su) ®

626. Supervised Practicum in Early Childhood Education. (3) ®

630. Workshop in Mathematics Education. (1-3) ®

633. Supervision and Administration Internship. (3) ®

634. Issues in Teaching of Reading. (1-9) ®

635. Diagnosis of Reading. (3)

636. Remedial Reading Instruction. (3)

637. Practicum in Remedial Reading. (3) ®

640. Current Problems in Elementary Education. (3)

644. Creative Education. (3)

646. Education of the Gifted and Talented. (3)

647. Identification and Evaluation in Gifted Education. (3)

648. Materials and Methods in Gifted Education. (3)

649. Supervised Practicum in Gifted Education. (3-6) ®

650. Interdisciplinary Workshop. (1-3) ®

655. Practicum in the Evaluation of Instruction. (1-6) ®

656. Practicum in Improvement of Instruction. (1-6) ®

661. Topics in Middle Level Education. (3W,Su) ®

665. Improvement of Reading Instruction. (3)

670. Improvement of Science Instruction. (3)

671. Multicultural Education. (3)

675. Improvement of Mathematics Instruction. (3)

680. Improvement of Social Studies Instruction. (3)

685. Improvement of Language Arts Instruction. (3)

690. Independent Study. (1-3) ®

691. Independent Research. (1-3) ®

696. Master's Project. (3-6) ®

697. Thesis. (1-12) ®

699. Continuing Graduate Advisement. (1-12) ®

702. History and Philosophy of Early Childhood. (3)

705. Internship in Program Evaluation. (1-6) ®

706. Internship in Research. (1-6) ®

712. Student Teaching Supervision. (1-6)

733. Supervision Internship. (3-12) ®

735. Internship in Curriculum Development. (1-6) ®

750. Interdisciplinary Workshop. (1-3)

755. Evaluation of Supervisory Performance. (1-6)

781. Research Seminar. (1) ®

790. Independent Study. (1-3) ®

791. Independent Research. (1-3) ®

797. Dissertation. (1-12) ®

799. Continuing Graduate Advisement. (1-12) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

Department of
English
College of Humanities, Arts and Social Sciences

Head: Professor Jeffrey Smitten
Office in Ray B. West 201, 797-2733
Assistant Head: Professor Christine Hult
Office in Ray B. West 201B, 797-2735

Professors Jay Anderson, Jan Bakker, Kenneth W. Brewer, Joyce A. Kinkead, Thomas J. Lyon, Willis L. Pitkin, Jr., Reed C. Stock, Barre Toelken; **Associate Professors** Theodore Andra, Kate M. Begnal, Patricia Gardner, Sonia S. Manuel-Dupont, Jan E. Roush, Anne Shifrer, Ronald R. Shook, Steve Siporin; **Assistant Professors** Evelyn I. Funda, Bishnupriya Ghosh, Keith A. Grant-Davie, David E. Hailey, Jr., Phebe Jensen, Brian W. McCuskey, John E. McLaughlin, Lynn L. Meeks, Roberta S. Stearman; **Lecturers** John A. Butler, Helen Cannon, Marina L. Hall, Nancy O'Rourke

Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA), Master of Arts (MA), and Master of Science (MS) in English; BS, BA, MA, and MS in American Studies

Objectives

The Department of English offers a variety of courses that provide majors and minors with the opportunity to (1) explore literature in relation to both personal and cultural contexts, (2) gain competency in research and writing, and (3) acquire insights into the nature of the English language. Students are encouraged to gain an appreciation of language and literature through reading, analysis, and writing, both as a practical tool of communication and as a means of enriching their personal values and beliefs. Through development of strong communicative, analytical, and interpretive skills, students are prepared for demanding and unpredictable careers in writing, editing, and publishing in the fields of law, business, industry, and government, as well as for positions in public and higher education.

The Department of English also offers a wide variety of courses that support other fields of specialization in addition to specific writing and humanities courses that fulfill University General Education and Liberal Arts and Sciences requirements.

Six programs are available for undergraduate study: (1) Literary Studies Option, (2) Professional Writing Option, (3) English Teaching Option, (4) English Teaching Minor, (5) Standard English Minor, and (6) American Studies Major.

Admission Requirements

Admission requirements for the Department of English are the same as those described for the University on pages 8-11. Students who have been admitted to other colleges but desire to change their major to English or American Studies must present an official copy of their University work to the Department of English for approval. Students who intend to certify to teach English at the secondary school level and thus fulfill the English Teaching Major requirements must also apply for admission to the Teaching Education program (see pages 44 and 218 for procedures and requirements pertaining to teacher certification as well as the current edition of *Guide to the Undergraduate Program in Secondary Education at USU*).

New freshmen admitted to USU in good standing qualify for admission to the English major. Transfer students from other institutions and from other USU majors need a total GPA of 2.75 or higher for admission to the English major.

All English majors and minors must maintain a 2.75 or higher GPA in their English courses to remain matriculated in English and to obtain official approval for graduation. All courses listed as major or minor subject courses must be taken on an *A-B-C-D-F* basis. Major subject courses passed with less than a *C-* grade must be repeated.

To qualify for a Bachelor of Arts (BA) rather than a Bachelor of Science (BS) degree, English majors must achieve a two-year level of competency in a foreign language.

General Education Requirements

Students selecting the Literary Studies Option, the Professional Writing Option, or the American Studies Major are required to complete the Area Studies Certificate in the Liberal Arts and Sciences Program (LASP) to fulfill the Broadening Knowledge section of the University General Education requirement. Students in the English Teaching Option are encouraged to fulfill these LASP requirements, but may instead choose to fulfill the current General Education Broadening Knowledge requirement.

Specific Program Requirements

As this catalog goes to press, revisions are being made in all three options. For current requirements, contact the English Department.

Core Requirements. All English majors are required to complete the following courses as soon as possible before enrolling in upper-division courses: Engl 109, 190, 212, and two 200-level survey courses (Engl 216, 217, 251, 260, 261). Some of these courses may be waived by passing CLEP subject examinations, by Advanced Placement credit, by evidence of equivalent courses, and, where appropriate, by department examinations. English majors are also encouraged to take the English major's section of Engl 201 to satisfy the University's written communication requirement. **Students must also complete 6 credits of upper-division writing courses.**

Literary Studies Option. In addition to fulfilling the 17-credit English Core requirements, the student in the Literary Studies Option completes 60 more credits of coursework, which includes (1) 9 credits in language/linguistic courses: Engl 409, 410, 509 or 510; (2) 24 credits of upper-division American and British literature courses: Engl 521, Engl 535 or 538, Engl 539 or 540, Engl 561 or 562, Engl 563 or 564, Engl 565 or 566, Engl 548 or 567, Engl 420 or 448 or 478; (3) 9 credits in writers and topics: Engl 586 or 589, Engl 587 or 588, Engl 556 or 585; (4) 6 credits of literature of other cultures; (5) 12 credits of electives in areas such as creative writing, folklore, etc.

Professional Writing Option. In addition to fulfilling the 17-credit English Core requirements, the student in the Professional Writing Option completes 60 more credits of coursework, which includes: (1) 12 credits in langugage/linguistic courses: Engl 210, 409, 410, 413, 453, 509, 510; (2) 15 credits in writing content courses: Engl 301, 302, 305, 306, 413, 427, 501, 502, 504; (3) 15 credits in writing theory/application courses: Engl 413, 415, 485, 486, 487; (4) 6 credits of upper-division (300-level and above) literature courses; (5) 12 credits of courses selected from disciplines that enhance or support whatever emphasis the student has developed within the Professional Writing Option (editing, copywriting, technical writing, public relations, etc.)

English Teaching Option. In addition to fulfilling the 17-credit English Core requirements, the student in the English Teaching Option completes 48 more credits of coursework, 51 credits of Professional Education courses, and approximately 28 credits of a teaching minor. The 48-credit English requirement includes: (1) 9 credits of language/linguistic courses: Engl 409, 410, Engl 509 or 510; (2) 15 credits of professional courses: Engl 401, 403, 405, 413, 418; (3) 24 credits of upper-division (300-level and above) literature courses, including Engl 417, 451, Engl 587 or 588, 6 credits of American literature, 6 credits of British literature, and 3 credits in a genre or folklore or specialty area.

Because the teaching option requirements are subject to State Board of Education changes in certification requirements and the changing needs of secondary schools, students should check the current edition of *Guide to the Undergraduate Program in Secondary Education at USU* or the English Major Requirement Sheet, available from the English Department, for an exact list of requirements.

English Teaching Minor. After obtaining approval for admission (see departmental admission requirements above), students must complete the following 30-credit requirement: Engl 109, 251, Engl 260 or 261, Engl 401 (Engl 301 or ScEd 306 is a prerequisite), Engl 403, 405, 417, 418, 451, Engl 587 or 588; and ScEd 320. Any deviation from this plan must have the prior approval of the English Department's Director of Undergraduate Studies.

English Standard Minor. Graduation approval for a nonteaching minor in English will be given for a program which includes the following minimum requirements: 9-10 credits of lower-division courses (excluding Engl 101, 111, 200, or 201); 6 credits of upper-division writing courses; and 12 credits of upper-division writing, literature, and/or English language study. The program must be approved by the Director of Undergraduate Studies at least one year prior to graduation.

American Studies Major. The American Studies program is supervised by the American Studies committee, comprised of representatives from participating departments. As an interdepartmental program, it is designed to allow students maximum freedom in pursuing academic interests by permitting a choice of an area of concentration and relevant courses from the offerings of a variety of departments. The interdisciplinary structure of the program offers students an opportunity to integrate studies in various fields into a broad understanding of American culture and its antecedents.

Upon declaring intention to major in American Studies, students will be assigned an adviser. With the assistance of the adviser, students will plan programs which (1) meet the standard lower- and upper-division requirements for the BA or BS degree; (2) meet any specific requirements of the department in the area of concentration; and (3) respect the interdisciplinary spirit of American Studies.

In most cases, American Studies majors must complete a minimum of 35 credits in the area of concentration. Although no minor is required, students must also earn an additional 35 credits in other fields which will broaden understanding of American culture. Courses in at least three of the following fields (excluding the area of concentration) must be represented in the distribution of the 35 credits: history, geography, literature, philosophy, psychology, sociology, anthropology, political science, and economics.

American Studies majors are required to take two interdisciplinary course blocks ("Main Currents in American Culture" and "The American Frontier"). These will occupy most of two quarters.

For additional information concerning the American Studies program, check with the English Department, Ray B. West 201.

Financial Support

In addition to the scholarships, assistantships, grants-in-aid, and work study programs available through the University, the department employs a few students to work as peer tutors in The Writing Center. The department also oversees some cooperative education and internship opportunities for students.

Scholarships. English Department scholarships are available on a competitive basis for sophomores, juniors, and seniors. Applications are accepted in January and February. See the English Department for more specific information.

Graduate Study

The Department of English offers the MA or MS degree for English majors and either the MA or MS degree for American Studies majors. See the current issue of the *Graduate Catalog* for further information. Application for admission to a graduate program is made through the School of Graduate Studies.

English Courses

001. Basic English. Developing writing skills through peer-group work and conferences; for students needing additional writing practice before taking Engl 101 or 111. (3F,W,Sp) ®

Lower Division

WC 101. English Composition. Developing writing strategies and skills in fluency and revision. (3F,W,Sp,Su)

109. Elements of Grammar. Study of sentences and sentence-types to prepare students for editing tasks and tests. (3) ©

110. Vocabulary and Word Origins. A study of Latin and Greek root words as a way to build vocabulary. (3F,W,Sp,Su)

WC 111. Strategies of Writing. Analyzing and composing written discourse; a pass/fail equivalent of Engl 101. (3F,W,Sp,Su)

HU 113. Great Literature of Europe. A general survey of major literary works and authors of Europe. Designed to broaden one's knowledge of Europe's literary heritage and development. (3F,W,Sp,Su)

HU 114. Great Literature of Britain. A general survey of major literary works and authors of Britain. Designed to broaden one's knowledge of Britain's literary heritage and development. (3F,W,Sp,Su) ©

HU 115. Great Literature of America. A general survey of major literary works and authors of the United States. Designed to broaden one's knowledge of America's literary heritage and development. (3F,W,Sp,Su)

116. Understanding Literature. An introduction to the types and basic elements of short stories, novels, and poetry of different periods and cultures. Required for English Teaching minors. (3F,W,Sp,Su)

HU 120. Great Books and Ideas. Man's ideas about himself, the universe, and the divine. (3)

HU 121. Great Books and Ideas. Man's ideas about social relationships. (3)

HU 122. Great Books and Ideas. Man's ideas about the modern world. (3)

(Courses 120, 121, and 122 are related, but they are taught as independent units and need not be taken as a series.)

HU 124. Introduction to Folklore. Major types of folklore (e.g., legend, folktale, ballad, folksong, custom, belief, art, and craft); practical experience in collecting folklore. (3)

HU 126. Mythology. An exploration of myths in early cultures as a way to help us understand our heritage and our place in the scheme of life. (3F,W,Sp,Su)

150. American Character in Film. An exploration of the American national character, using commercial films as a teaching tool. (3Sp)

190. English Orientation. Orientation to the English Department. Provides initial, objective information about the study of literature, writing, and professional opportunities. Required of all English majors. (1F,W)

195. Individualized Writing Instruction. For students desiring further practice in specific areas of writing. Instructor's consent required. (1-3F,W,Sp)

WC 200. Persuasive Writing. Writing the essay from various persuasive stances; includes methods of documentation. Prerequisite: Sophomore standing and completion of Engl 101, 111, or equivalent. (3)

WC 201. Research Writing. Developing library research methods for writing documented essays and term papers. Prerequisites: Sophomore standing and completion of Engl 101, 111, or equivalent. (3F,W,Sp,Su)

210. Language Awareness: The Uses and Misuses of Language. Study of language as a tool for problem solving, emotional adjustment, and communication, including ways language may be used to misinform and manipulate. (3)

212. Introduction to Literary Analysis. Required of all English majors as a prerequisite to upper-division literature courses. (3F,W,Sp,Su)

216. World Literature Survey to 1650. (5)

217. World Literature Survey from 1650. (5)

251. American Literature Survey. (5)

260. British Literature Survey to 1798. (5) ©

261. British Literature Survey from 1798. (5) ©

Upper Division

301. Advanced Writing. Advanced nonfiction writing strategies, development, and style. Prerequisites: Upper-division standing and completion of Engl 200, 201 or equivalent. (3F,W,Sp,Su)

302. Fiction Writing. Covers the basic elements of writing short fiction: form, structure, plot, theme, characterization, point of view, and imagery. (3F,W,Sp)

303. Introduction to Playwriting. Practice in writing plays. Prerequisite: Engl 302 or equivalent. (3) ®

305. Technical and Professional Writing. Designing, structuring, and editing technical/scientific communications. Prerequisites: Upper-division standing and completion of Engl 200, 201, or equivalent. (3F,W,Sp,Su)

306. Poetry Writing. Covers the basic elements of writing poetry: language detail, tone, voice, literal and figurative imagery, rhythm, open and closed form, structure, and theme. (3F,W,Sp)

325. Science and Fantasy Fiction. Explores history, development, directions, and themes of science, speculative, and fantasy fiction. (3)

330. Women Studies: Women in Literature. Analysis of women characters in literature. (3) ®

372 (d672).[1] Folklore Colloquium. Issues, problems, and methodologies in folklore study. (3)

395. Individualized Writing Instruction. Working in the Writing Center and with instructor on writing assignments from an approved upper-division course in student's major (1 credit of 395 for each 3 credit course in major). Instructor's consent required. (1-3F,W,Sp,Su)

401. Composition for Teachers. Principles of effective composition and teaching techniques; extensive practice in writing; evaluation of professional and student work in both discussion and demonstration. Prerequisite: Engl 301 or equivalent course. (3)

403. Teaching Composition With Computers. Explores the most recent information on teaching written composition with computers, including theories of changing classroom dynamics and teaching writing in a networked computer setting. (3F,W,Sp,Su)

405. Diagnosing Writing Problems. Methods of recognizing and diagnosing remedial level writing problems, preparing students to teach composition to basic level writers. Prerequisite: Engl 410. (3)

409. Introduction to Phonology and Morphology. Introduction to linguistic principles of English phonology and morphology. (3F,W,Sp,Su)

410. Introduction to Syntax and Semantics. Introduction to linguistic principles of English syntax and semantics. Prerequisite: Engl 409. (3F,W,Sp,Su)

413 (d613). Topics in Writing and Rhetoric. Intensive study of current trends in writing and rhetoric. (2-3) ®

414. Folklore in an Age of Mass Media. How folklore is subsumed in and altered by modern news and entertainment media, and how media perform traditional narrative functions. (3Sp)

415. Reading Theory for Writers. Examines reading and ways that reading and writing can influence each other, including reading processes, rereading, readability, and relationships readers and writers create through text. (3)

416. Children's Literature. Study of prose and poetry for elementary school children. (3) ©

417. Young Adult Literature. Study of prose and poetry for the secondary school age. (3W,Sp)

418. Literature for Teachers. Strategies for teaching literature in secondary schools including evaluation and selection of materials, and methods of presenting literature to students of diverse reading backgrounds. (3Sp)

420. Modern Poetry. (3)

422. Ballads and Folksongs. Study of the lyrics of traditional songs and ballads; theories of transmission, literary and historical importance, notable collectors and recordings. (3)

423. American Folklore. American folk art and literature and the historical and cultural circumstances from which they developed. (3)

424. American Folk Styles. Survey of American culture: students learn techniques and perspectives enabling them to look at artifacts as texts to be deciphered for the historical, cultural, and aesthetic meanings. (3)

425. The Bible as Literature. A survey of the major writings from the Hebrew tradition in the King James version of the Old and New Testaments. (3)

426. Mythology. An advanced survey of world mythologies. May be repeated from different instructors. (3) ®

427. Internship/Cooperative Work Experience. Course credit for professional experience outside the classroom prior to graduation. Statement of professional goals and a summary report following the experience are required. Prerequisite: Departmental approval. (1-15F,W,Sp,Su) ®

428. Greek Literature. Masterpieces of Greek literature in translation, with emphasis upon drama. (3)

429. Roman Literature. Masterpieces of Roman literature in translation. (3)

430. History of the Theatre I: Origins to 17th Century. (3)

432. History of the Theatre II: 17th Century to WW II. (3)

436. Masterpieces of British Drama. Study of major works in British drama from the beginnings to 1890, including Elizabethan, Stuart, restoration, eighteenth and nineteenth century plays. (3)

448. American Fiction. (3)

450. Student Teaching Seminar. Focus upon problems arising during student teaching. Includes teaching plans, procedures, adaptive classroom practices, and evaluation. To be taken concurrently with ScEd 460. (3F,W,Sp)

451. Multicultural American Literatures. Introduction to the study of ethnically diverse literatures of the United States, including Native American, Asian American, Hispanic/Latino, and African American. (3)

453. Language and Society. (3)

459. Folklore of Utah. Study of the lore of major Utah folk groups (ethnic and immigrant, occupational, religious, and regional). (3)

478. The British Novel. Survey of the British novel from its beginnings in the eighteenth century to the present. (3)

485. Theories of Document Design. Application of design principles to the creation of written text, tracing the steps necessary to present information in its most readable form. (3F,W,Sp,Su)

486. Professional/Technical Editing. The theoretical, ethical, and practical elements of editing will be addressed by students working with academic, scientific, and technical prose. Prerequisite: Engl 109 or permission of instructor. (3F,W,Sp,Su) ®

487. Theory and Application of Electronic Texts. Examines electronic texts in their cultural contexts and explores the creative and empowering potential of such texts. (3-5F,W,Sp,Su)

492. Senior Practicum. (1) ®

501 (d606). Advanced Poetry Writing. Advanced practice in writing poetry. Prerequisite: Engl 306 or equivalent. (3) ®

502 (d602). Advanced Fiction Writing. Advanced practice in writing fiction. Prerequisite: Engl 302 or equivalent. (3) ®

504 (d604). Advanced Essay Writing. Developing sophisticated skills for writing the publishable essay. Prerequisites: Upper-division standing and completion of Engl 301 or 305 or equivalent writing proficiency or instructor's consent. (3) ®

509. History of the English Language. (3)

510. Topics in Linguistics. Specialized topics in linguistics for English students. Prerequisites: Engl 409 and 410. (3F,W,Sp,Su) ®

521. Literary Criticism. A survey of the major methods and philosophies of literary criticism from the classical to the contemporary. (3)

524 (d624). Regional Folklore. Folklore of a specific region, identified each quarter taught. (3) ®

IO 526. Legends, Myths, and Folktales. Substance and significance of folk prose narratives both in the past and in contemporary society. (3)

532. Seventeenth and Eighteenth Century World Literature. (3)

533. Nineteenth and Twentieth Century World Literature. (3)

534. Modern Continental Drama. (3)

535. American Literature: 1607-1820. (3)

538. American Literature, 1820-1865. (3)

539. American Literature: 1865-1920. (3)

540. American Literature: 1920-1945. (3)

541. Western American Literature. (3)

543. The American Frontier. Upper-division interdisciplinary seminar designed to synthesize, amplify, and enrich the content of a block of general education courses taken concurrently as prerequisites to the seminar. (3W)

546 (d646). Folk Groups and Folklore Genres. Survey of folk groups and folklore genres. Taught during Fife Folklore Conference only. (3Su) ®

548. American Literature Since 1945. American writing since 1945 in the context of significant historical, political, social, and cultural events: Vietnamese War, civil rights movement, women's movement, etc. (3)

549. Modern American Drama. (3)

556. Topics in American Literature. Intensive study of select American writers, regional and ethnic groups, and special topics (Black, Hispanic, Mormon literature; Southern literature; nature, naturalism, historical fiction, etc.). (2-3) ®

561. Medieval British Literature. (3) ©

562. Sixteenth Century British Literature. (3)

563. Seventeenth Century British Literature. (3)

564. Eighteenth Century British Literature. (3)

565. Romantic Period British Literature. (3)

566. Victorian Period British Literature. (3)

567. Twentieth Century British Literature. (3)

579 (d679). Folklore Fieldwork. Introduces advanced student to problems and techniques of fieldwork, including making sound recordings of orally-transmitted expressions, photographs of material traditions, and descriptions of problematic genres. Technical training, ethics, field exercises, analysis, plus perspectives on archiving and publication of results. (3) ®

582. Senior Seminar. Capstone course for students enrolled in English Honors Program. (1-3) ®

584. Modern British Drama. (3)

585. Topics in British Literature. Intensive study of select British writers, themes, or topics. (2-3) ®

586. Chaucer. (3) ©

587. Shakespeare: Comedies and Histories. (3)

588. Shakespeare: Tragedies. (3)

589. Milton. (3)

595. Readings and Conference. Offered every quarter. Students must have the approval of the head of the department. (1-5) ®

596 (d644). American West: Its Literature and History. (2-3Su) ®

597. Senior Thesis. Prerequisite: Enrollment in the English Honors Program. (1-10) ®

Graduate[2]

600. Bibliography and Research Methods. (3)

602 (d502). Advanced Fiction Writing. (3) ®

604 (d504). Advanced Essay Writing. (3) ®

605. Rhetoric and Basic Writing. (3)

606 (d501). Advanced Poetry Writing. (3) ®

607. Creative Writing in the Classroom. (3)

608. Topics in Technical Writing. (3) ®

611. Discourse: Analysis and Synthesis. (3)

613 (d413). Topics in Writing and Rhetoric. (2-3) ®

616. Advanced English Methods. (3)

617. Modern Composition Theory. (3)

618. History of Rhetoric to 1900. (3)

620. Introduction to Literary and Cultural Studies. (3) ®

621. Literary Criticism. (3)

622. Folk Narrative. (3) ®

624 (d524). Regional Folklore. (3) ®

625. Graduate Internship/Cooperative Work Experience. (1-15) ®

626. Periods in American Literature. (3) ®

627. American Authors. (3) ®

628. Genres of American Literature. (3) ®

629. Themes in American Literature. (3) ®

630. Periods in British Literature. (3) ®

631. British Authors. (3) ®

632. Genres of British Literature. (3) ®

633. Themes in British Literature. (3) ®

636. Regionality in Literature. (3) ®

637. Race, Class, Gender, and Religion in Literature. (3) ®

638. Film and Popular Culture. (3) ®

644 (d596). American West: Its Literature and History. (2-3Su) ®

646 (d546). Folk Groups and Folklore Genres. (3)

657. American Studies Internship in Mountain West Culture. (2-13) ®

669. Themes in Folklore. (3) ®

672 (d372). Folklore Colloquium. (3) ®

673. Studies in Folklife. (3) ®

674. Outdoor Museum Planning and Administration. (3)

675. Outdoor Museum Research and Conservation. (3)

676. Outdoor Museum Interpretation and Educational Programming. (3)

677. History Museum Internship. (6-12) ®

678. Scholarly Editing Internship. (2-6) ®

679 (d579). Folklore Fieldwork. (3) ®

680. Proseminar. (2) ®

682. Seminar. (3) ®

692. Practicum in Writing Instruction. (1-3) ®

693. The Teaching of English. (3) ®

695. Independent Study. (1-5) ®

697. Thesis. (1-10) ®

699. Continuing Graduate Advisement. (1-3) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

Department of
Family and Human Development
College of Family Life

Head: Professor Brent C. Miller
Office in Family Life 211, 797-1501

Professors Ann M. B. Austin, Glen O. Jenson, Thomas R. Lee, Jay D. Schvaneveldt; **Adjunct Professors** Frank R. Ascione, Deborah A. Byrnes, Sarah Rule; **Professor Emeritus** C. Jay Skidmore; **Associate Professors** Randall M. Jones, Shelley L.K. Lindauer, Thorana S. Nelson, D. Kim Openshaw, Lori A. Roggman; **Assistant Professors** Scot M. Allgood, Silvia Sörensen; **Research Assistant Professor** JoAnn T. Tschanz; **Adjunct Assistant Professors** Glenna C. Boyce, T. Brent Price; **Lecturers** Deborah B. Ascione, Farol Ann G. Nelson; **Adjunct Lecturer** Larry E. Jones; **Adjunct Clinical Lecturers** Gwenaelle Couillard, Victor H. Nelson; **Instructor Emeritus** Elaine T. Ashcroft; **Practicum Coordinator** Susan L. Ericksen

Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA), and Master of Science (MS) in Family and Human Development; BS and BA in Early Childhood Education; specialization in Family and Human Development in the Family Life Doctor of Philosophy (PhD)

Focus within majors: The Family and Human Development major includes two emphases: Human Development, and Marriage and Family Relationships; Early Childhood Education includes certification K-3rd grades.

Gerontology Certificate Program: The Gerontology Certificate Program at Utah State University is administered through the Department of Family and Human Development, FL 214, 797-1543. Students preparing for careers in the field of aging

complete 24 credits of aging-related coursework, including a supervised field practicum in a gerontological setting. Required courses include FHD 301, 420; Soc 275 or 475; HEP 545; 6 credits of approved electives; and FHD 435 (6 credit internship). For a list of requirements for this interdisciplinary certificate, contact the department. A minimum GPA of 2.67 is required for the Gerontology Certificate.

Objectives

The Department of Family and Human Development offers a variety of courses designed to prepare students for careers in teaching or for positions as family and human development specialists in agencies serving children and other family members. Majors are exposed to a curriculum which ranges from infancy to old age, and from marital formation to marital dissolution through death or divorce. These classes deal with current issues and problems confronting families and children in the nation and the world, and students develop the necessary knowledge and skills to deal professionally with these issues.

Students in the department are required to complete at least one practicum experience, which may be done in a variety of ways. Undergraduate students work with the practicum coordinator to arrange practicum experiences locally or in other geographical areas. Types of practicum sites include state agencies, hospitals, preschools and day care centers, nursing homes, retirement homes, parenting programs, drug and alcohol programs, detention centers, and crisis intervention centers. Practicum experience in the human development emphasis is completed in the Adele and Dale Young Child Development Lab setting. Those students majoring in early childhood education complete a formal internship in the Adele and Dale Young Child Development Labs and in primary grades as part of this focus. Graduate students also can arrange practica, and extensive clinical internships are required in the marriage and family therapy emphasis of the FHD master's degree.

Majors in Family and Human Development, as well as in Early Childhood Education, receive the necessary preparation for graduate study in a family-human development related field or employment in Headstart and child care programs, extension services, hospitals, social service agencies, senior citizen centers, adoption agencies, family planning, foster care, runaway centers, family crisis centers, parent education programs, and similar agencies. Some majors acquire a teaching certificate so they can also teach in the public schools.

In addition to advanced study or job opportunities for majors in Family and Human Development, students receive increased knowledge and skills in topics which will enhance personal and family life. Preparation for marriage, parenthood, and family living is a central concern in the department.

All majors in the department are accredited by the American Association of Family and Consumer Sciences. Certification in Early Childhood Education is also available.

Requirements

Departmental Admission Requirements. Any student can declare a premajor in FHD. However, completion of 36 quarter credits (including FHD 120 and 150) with a cumulative GPA of 2.75 is required for admission into the major. Students who have met these requirements should bring a copy of their transcript and the *Change of Major* form to FL 214 to obtain a signature from the undergraduate adviser. A minimum GPA of 2.67 in the major is required for graduation.

College Requirements. All majors must complete the basic College of Family Life curriculum for common understanding (see page 50). AP and CLEP credit can be used to meet some of the required technical and General Education courses.

Departmental Requirements. In addition to the college requirements, the department has four regulations which govern academic conduct. These regulations include:

1. A 2.0 overall grade point average, consistent with the University requirement for graduation, is required. A 2.67 GPA in the major (departmental requirements only) is also required.

2. A required course may only be repeated once to improve a grade.

3. Completion of all major requirements, as illustrated below.

4. The *P/D+, D, F* option may not be used in courses required in the major or in the FHD minor.

Family and Human Development Major Requirements. All majors in family and human development (with the exception of ECE majors) complete a common departmental major of 56 credits as follows:

Introductory and Research Courses: FHD 120, 150, 260, and 310; Stat 201 or Psy 380 or Soc 312.

Marriage and Family Courses: FHD 304, 376, and 420.

Family and Human Stress Courses: FHD 300, 301, and 412.

Developmental Courses: FHD 378, 379, 380, and 381.

Students must choose **one** of the following emphases. **Human Development:** FHD 455 and 475[1], or **Marriage and Family Relationships:** FHD 370 and 425[2].

FHD Minor. A minor in FHD requires 20 hours of FHD credits, including FHD 120 and 150. Minor requirement sheets are available in FL 211. The *P/D+, D, F* option may not be used in courses required for the minor.

Early Childhood Education Major Requirements. Majors in early childhood education are certified to teach in preschool through third grade. Several practica and field experiences with children are provided, and a subject matter minor is selected (e.g. science, language arts, etc.). This major is a cooperative effort between the Department of Family and Human Development and the Department of Elementary Education. Students are required to complete a student teaching practicum in a preschool program, a kindergarten, and in the public schools grades 1, 2, or 3. Additional materials describing the ECE major in the Department of Family and Human Development are available upon request from the ECE advisers or department head.

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[1]Students must apply for FHD 475 4-5 quarters in advance of taking the class. Apply in Family Life Building, room 214.

[2]Quarterly deadlines for practicum application are: April 15 for fall, July 15 for winter, October 15 for spring, and January 15 for summer. It is highly recommended that students work in their practicum experience for at least two quarters. Apply in Family Life Building, room 214.

For more detailed information about the Family and Human Development and Early Childhood Education majors, see advisement guides available in the administrative office of the department. These guides also provide details about minors, recommended electives, and the gerontology certificate. Students should also check with the department for current requirement sheets, which are updated each year.

Financial Support

In addition to the scholarships, assistantships, grants-in-aid, and work-study programs available through the University, the College of Family Life and the Department of Family and Human Development also give several tuition waivers, scholarships, and other types of support each year. Students should inquire at the Dean's Office in Family Life 205, the departmental office in Family Life 211, or the Financial Aid Office in Student Center 106.

Graduate Study

The department offers the Master of Science degree (MS) in Family and Human Development. The college offers the doctorate degree (PhD) with an emphasis in Family and Human Development. Both degrees have specialties in infancy and childhood, adolescence and youth, and marriage and family relationships. The department reactivated the marriage and family therapy emphasis for the master's degree effective fall 1992, and this constitutes a fourth area of emphasis at the MS level. Further information may be obtained from the department and by referring to the USU *Graduate Catalog*.

Family and Human Development Courses

SS 120. Marriage and the American Family. Overview of courtship, marriage patterns, child bearing and rearing, and adaptive functions of the family in the U.S. (3F,W,Sp) ©

SS 150. Human Growth and Development. Overview of development from conception through maturity. (5F,W,Sp) ©

250. Seminar in Early Childhood Education. Orientation to current philosophies, teaching techniques, and curriculums found in programs for young children. Must be taken concurrently with FHD 252. (3F,Sp)

252. Practicum in Early Childhood Education. Practicum experience as a student aide in an early childhood education program (e.g., Child Development Lab, Children's House, child care center, etc.). Must be taken concurrently with FHD 250. (1-6F,Sp) ®

260. Guidance of Children. Review of various guidance philosophies with emphasis on principles and techniques. (3F,W,Sp) ©

300. Child Abuse and Neglect: A Multidisciplinary Approach. Increases knowledge and awareness of the causes, identification, reporting, and treatment of abused children and abusive parents. Prerequisites: junior standing and FHD 150. (3W) ©

301. Death and Dying as Family Experience. Understanding and coping with death and dying in modern family systems; education for grief and bereavement. Prerequisites: junior standing and FHD 120, 150. (3Sp)

SS 304. Human Sexuality and Family Relations. The family as a primary group and socialization agency in the building of attitudes and influencing behaviors in human sexuality. (3F)

310. Research Methodology in Family and Human Development. Introduction to common methodologies used in current family and human development research. Emphasis is placed upon becoming a knowledgeable and informed consumer of research. (3F)

370. Marriage and Family Therapy: An Introduction. Philosophy, principles, and techniques of premarital, marriage, and family counseling. Prerequisites: junior standing and FHD 120. (3F)

376. Contemporary Family in the United States. Structure and function of the family institution, interaction with other social networks, internal compositions and life-cycle processes, and family as a small group. Prerequisites: junior standing and FHD 120. (3F)

378. Understanding Infants. Development of the child from conception to two years. Physical, social, emotional growth; parenting skills. Lab required. Prerequisites: junior standing and FHD 150, 260. (3F,W,Sp)

379. Children Two to Five. Examination of normal growth patterns of the preschool-age child. Observation experiences. Prerequisites: junior standing and FHD 150, 260. (3W)

380. Children Six to Twelve. Growth and development of normal children. Guidance principles related to behavior of children at these age levels. Lab required. Prerequisites: junior standing and FHD 150, 260. (3F,W,Sp)

381. Adolescence. The social-psychological and physical aspects of becoming an adolescent in modern societies. Social and cultural expectations stemming from the family, school, and the community. Prerequisites: junior standing and FHD 150. (3Sp)

412. Families in Crisis. Designed to enable FHD and other service-oriented students to understand the trauma and recovery process associated with normative and catastrophic crisis. Prerequisites: junior standing and FHD 120, 150. (3W)

415. Pre-practicum Skills in Family and Human Relationships. Acquisition and integration of interpersonal skills, conflict resolution, and ethical decision-making skills for active participation in FHD practicum settings. Prerequisites: junior standing and FHD 120, 150, 260, 301, 304, 412. (3F,W,Sp,Su)

420. Families in Middle and Later Life. Family development; launch process; intergenerational relations between grown children and their parents; understanding older family members. Prerequisites: junior standing and FHD 120, 150. (3W)

425. Practicum. Placement experience in applying skills and knowledge in community agencies. One credit for 30 hours of experience. Senior standing. Apply two quarters in advance. Prerequisites: junior standing and FHD 120, 150, 415, and 10 other required FHD courses, for a total of 41 FHD credits. (1-12F,W,Sp,Su) ®

431. Women and Men. Women and men in the family, in society, and in relationships with each other. (3)

435. Practicum in Gerontology and Aging. Placement experience in gerontology settings. Practical opportunities to apply theory, knowledge, and skills. One credit for 30 hours of training experience. Senior standing. Apply two quarters in advance. (1-6F,W,Sp,Su) ®

440. Family Life Education. Study of parent, teacher, and community needs in relation to problems of education for family life. Inservice training for teachers and group leaders. (3)

455. Methods and Curriculum for Preschool Children. The use of materials, equipment, and activities in planning a curriculum and teaching preschool children. Prerequisites: junior standing and FHD 150. (3F,W)

475. Practice Teaching in Child Development Laboratory. A teaching internship in the Child Development Lab program. Arrangements need to be made at least one year in advance. Prerequisites: junior standing and FHD 150, 260, 455. (3-6F,W,Sp,Su)

490. Independent Study. (1-6F,W,Sp,Su) ®

550. Interdisciplinary Workshop. (1-3F,W,Sp,Su) ®

565. Parenting and Family Life Education. Methods and theories in family life education, applied to current parenting issues. (3)

Graduate[3]

601. Socialization in Human Development. (3W)

606. Theories of Human Development. (3F)

610. Seminar in Family Relations. (3F)

625. Graduate Internship. (1-12F,W,Sp,Su) ®

629. Survey of Marriage and Family Therapy Theories and Practice. (3F)

630.[4] Family Therapy Theories I. (4F)

631.[4] Family Therapy Theories II. (4Sp)

632.[4] Family Therapy Theories III. (4Sp)

637.[4] Ethics and Professional Issues in Human Development, Family Relations, and Family Therapy. (4W)

638.[4] Analysis and Treatment of Human Sexual Dysfunction and Dissatisfaction. (4F)

639.[4] Assessment in Marital and Family Therapy. (4W)

641.[4] Social Change and the Family. (3Sp)

650.[4] Family-child Interaction. (3W)

654.[4] Moral Development in the Family. (3Sp)

662. Using and Interpreting SPSS to Analyze Social Research Data. See instructor before enrolling. (3F,Sp)

670. Family Theory. (3W)

675.[4] Research Topics in Family and Human Development. (1-3F,W,Sp,Su) ®

677.[4] Aging and the Family. (3Sp)

680. Research Methods. (3Sp)

681.[4] Methodological Designs in the Study of Change. Prerequisite: FHD 680 or equivalent. (3W)

683.[4] Personality and Social Development in Adolescence. (3Sp)

684.[4] Family and Peer Relations During Adolescence. (3Sp)

685.[4] Family Health and Social Problems During Adolescence. (3Sp)

686.[4] Infancy. (3F)

687.[4] The Preschool Child. (3W)

688.[4] Middle Childhood. (3Sp)

690. Independent Study. (1-9F,W,Sp,Su) ®

692. Practicum in Marriage and Family Therapy. (1-6F,W,Sp,Su) ®

697. Thesis Research. (1-9F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-3F,W,Sp,Su) ®

701.[4] Research Seminar in Human Development. (3W)

706.[4] Theoretical Frontiers in Human Development. (3Sp)

710.[4] Research Seminar in Family Relations. (3W)

725. Advanced Graduate Internship. (1-12F,W,Sp,Su) ®

762.[4] Special Topics in SPSS Programming for Family Studies and Human Development. Prerequisite: Stat 560 or 605. (3W)

770.[4] Theoretical Frontiers in Family Relations. (3Sp)

775. Advanced Topics in Family and Human Development. (3F) ®

790. Independent Study. Prerequisite: instructor's permission. (1-9F,W,Sp,Su) ®

797. Dissertation Research. (1-12F,W,Sp,Su) ®

799. Continuing Graduate Advisement. (1-3F,W,Sp,Su) ®

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[3]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

[4]Not all courses are offered each year. Check with the department for current offerings.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

Department of
Fisheries and Wildlife
College of Natural Resources

Head: Professor Raymond D. Dueser
Office in Natural Resources 206, 797-2459

Professors Gary E. Belovsky, John A. Bissonette, Joseph A. Chapman, Charles P. Hawkins, John A. Kadlec, Frederic H. Wagner, Michael L. Wolfe; **Research Professor** J. Russell Mason; **Professors Emeriti** Jessop B. Low, John M. Neuhold, Allen W. Stokes; **Associate Professors** Michael R. Conover, Todd A. Crowl, Chris Luecke, Wayne A. Wurtsbaugh; **Research Associate Professor** Frederick F. Knowlton; **Associate Professor Emeritus** Gar W. Workman; **Assistant Professors** David A. Beauchamp, Thomas C. Edwards, Jr., Richard C. Etchberger, Barrie K. Gilbert, Terry A. Messmer, Mark E. Ritchie, Robert H. Schmidt, C. Anna Toline; **Research Assistant Professors** Eric M. Gese, Jeffrey L. Kershner; **Adjunct Assistant Professor** Ronald W. Goede

Associated Units: Cooperative Fish and Wildlife Research Unit, Predator Ecology and Behavior Project, U.S. Forest Service Cooperative Fish Habitat Relationships Unit, and Bureau of Land Management Water Quality Monitoring Laboratory

Degrees offered: Bachelor of Science (BS), Master of Science (MS), and Doctor of Philosophy (PhD) in Fisheries and Wildlife; MS and PhD in Ecology (Fisheries and Wildlife); MS and PhD in Ecology (Aquatic)

Areas of Specialization: BS degree in Fisheries and Wildlife has programs of emphasis in Fisheries Management and Wildlife Management (other undergraduate options can be arranged to meet student needs); MS and PhD degrees in Fisheries and Wildlife have specializations in Fisheries Management, Wildlife Management, Wildlife Ecology, Conservation Ecology, and Problem Wildlife Management

Objectives

The Department of Fisheries and Wildlife offers broad educational opportunities for students interested in the analysis and management of fish and wildlife populations, their habitats, and the related ecosystems. The department's philosophy of education is to promote a broad interdisciplinary approach to natural resource analysis and management.

Requirements

Departmental Admission Requirements. Admission requirements for the Department of Fisheries and Wildlife are the same as those described for the College of Natural Resources on page 55.

Bachelor of Science in Fisheries and Wildlife. The first two years of study include courses designed to give a student a sound scientific background and an introduction to the field of natural resources management. Students are required to complete Math 105, 215, and 216; Stat 201; Biol 125, 126, and 127; Chem 121, 122, 124, and 141; Phyx 120; Engl 101 and 201; FW 199, 270, 290, 300, 320, 386, 421, and either FW 271 or 291; NR 101, 102, and 201; two courses selected from FR 300, RR 300, RLR 300, or WS 300; the September Field Camp (FW 385, 387, and 388); and electives to make a total of 16 to 18 credits per quarter.

During the junior and senior years all students take NR 360, 370, 380, and 390; Phyl 504; FW 330, 401, 431, 540, and 599; and enough elective courses to complete the 160 credits required for the major. Additionally, students must meet the 186-credit University requirement (minimum of 60 credits in upper-division courses) and should satisfy either Option I or II of the General Education Requirements. (See General Education, pages 24-27, and Liberal Arts and Sciences Program, pages 37-38.)

Students should confer with a departmental adviser for information about changes in requirements or scheduling. The undergraduate program can be readily tailored to individual student needs with the help of a faculty adviser.

Fisheries and Wildlife Minor. The minor is designed for students with a strong background in biology. The department head's approval and a minimum of 21 credits are required in FW 270, 290, 300, 386, and two of the following courses: FW 320, 330, 401, or 540.

Graduate Study

The Department of Fisheries and Wildlife offers MS and PhD degrees in fisheries and wildlife, ecology (fisheries and wildlife), and ecology (aquatic) with programs of emphasis in wildlife biology, fishery biology, and related fields. See the *Graduate Catalog* for prerequisites and further information.

Fisheries and Wildlife Courses

Natural Resources courses 101 through 645 are listed under the College of Natural Resources, pages 55-56.

199. Wildlife Science Orientation Seminar. One class meeting per week, graded *P-F* based on attendance. Discussion of current issues in fisheries and wildlife; invited participation by outside speakers including other faculty. (1F)

225. Introductory Internship/Co-op. An introductory level educational work experience in an internship/cooperative education position approved by the department. (1-6F,W,Sp,Su) ®

231. Methods of Vertebrate Specimen Preparation. Designed to teach students how to prepare birds, mammals, and fishes as museum specimens. (2Sp)

IO 250. World Wildlife. An overview of the wildlife and fishery resources of the world with emphasis on non-North American forms and their relationships to humans in various cultures. Suitable for nonbiologists as well as biologists. (3F)

IO 260. Oceanography. Introduction to the basic aspects of marine environments with discussion of topical issues. Suitable for nonbiologists. (4W) ©

270. Fish Systematics and Function. Survey of fish families, emphasizing morphological, physiological, and behavior adaptations. Emphasis on North American freshwater fauna. (3F)

271. Fish Systematics Laboratory. Complementary laboratory to FW 270. Students learn to identify freshwater fishes of North America in the laboratory and the field. (2F)

LS 280. Conservation Biology. Survey of the causes and consequences of biological extinctions, the concepts that underpin biological conservation, and the problems inherent in implementing conservation policies. (3W)

LS 284. General Ecology. Interrelationships between organisms and their environments at levels of individual organisms, species populations, and ecosystems; emphasis on structure and function of latter two; human implications. Suitable for nonbiologists. (5F,Sp,Su)

290. Wildlife Diversity. Identification, distribution, life history, and behavior of waterfowl, upland game birds, and large mammals. Emphasis on ecological and evolutionary aspects of special relevance to management. (3Sp)

291. Wildlife Diversity Lab. Laboratory and field course in species identification, techniques of sex/age determination, and behavioral analysis. Emphasis on North American birds and mammals. (2Sp)

298. Fish and Wildlife Habitat Analysis. Introduction and practical experience in techniques of evaluating habitats of aquatic and terrestrial wildlife species. (1Su)

300. Principles of Fish and Wildlife Management. Ecological and sociological factors governing the management of fish, game, and nongame wildlife. Prerequisite: some knowledge of ecology. (3W)

310. Endangered Species. The biology and politics of endangered species with emphasis on endangered vertebrates. (3Sp)

316. Methods in Biotechnology: Basic Principles. A laboratory intensive course designed to provide a foundation in basic methods in biotechnology, including cell growth, and isolation and characterization of protein and DNA. (3F,Sp)

320. Introduction to Animal Behavior. General principles emphasizing social behavior and behavioral ecology. Designed for those with biology or psychology backgrounds. (3F)

330. Fisheries and Wildlife Populations. Dynamics of fish and wildlife populations, with emphasis on factors that influence population abundance and on mathematical models of population behavior. Prerequisites: FW/Biol 386, Math 215; Math 216 recommended. (3W)

350. General Fishery Biology. This course is offered only through the Continuing Education Independent Study Program. (5) ©

385. Field Ecology. Field and lab study of populations and ecosystems, both terrestrial and aquatic. (2)

386. General Ecology for Life Science Majors. Interrelationships among microorganisms, plants and animals, and their environments at the level of individual organisms; species populations and ecosystems with emphasis on the structure and function of the latter two; and human implications. (4F,W)

387. Techniques in Fisheries Management. Introduction to methodologies and equipment employed by fisheries biologists to gather information on fish populations and their habitats. Prerequisites: FW 270 and 290. (2)

388. Techniques in Wildlife Management. Introduction to methodologies and equipment employed by wildlife biologists to gather information and monitor wildlife populations and their habitats. Prerequisites: FW 270 and 290. (2)

IO 395. Environmental History. An examination of humanity's interaction with the environment throughout history and the origins and development of environmental conservation in the modern period. (3Sp)

401. Fisheries and Wildlife Policy and Administration. Intended to fill gap between biological emphasis of FW 300, 330, 421, and 431 series and Natural Resource policy emphasis of NR 390. Students will be acquainted with some of the main nonbiological issues facing wildlife managers and administrators. Prerequisite: NR 390. (3F)

405. Urban Fish and Wildlife Management. Includes urban wildlife: values and public attitudes, wildlife habitats and environments, urbanization effects, response of wildlife to urbanization, animal damage problems, and enhancing wildlife enjoyment. (3Sp) ©

410. Wildlife Law Enforcement. Review of principles of state and federal regulations of fish and game; discussion of apprehension of violators, rights of the individual, and collection of evidence and its use in court. (3Sp)

421. Management Aspects of Wildlife Behavior. Behavioral principles important in the management of wildlife. Prerequisite: FW 320. (3Sp)

425. Advanced Internship/Coop. Internship/cooperative education work experience; increased level of complexity with more professional level of experience as student advances toward completion of program. (1-15F,W,Sp,Su) ®

431. Management of Wildlife Populations. Application of the concepts and techniques of population biology in the management of aquatic and terrestrial animals. Prerequisite: FW 330. (3Sp)

460. Freshwater Ecology. Introduction to the physical, chemical, and biological factors operative in lakes and streams. A generalized discussion of aquatic habitats as nonisolated ecosystems. Prerequisites: Chem 121, 122; Phyx 120. (5W)

480. Undergraduate Research. Individual or team research. Prerequisite: adviser approval. (1-5F,W,Sp,Su) ®

481. Directed Reading. Prerequisite: adviser approval. (1-5F,W,Sp,Su) ® ©

491. Wildlife Problems. Individual study and research upon a selected wildlife problem. Prerequisite: adviser approval. (1-5F,W,Sp,Su) ®

495. Undergraduate Seminar. Intended to bring upperclassmen up-to-date on topics in the fisheries and wildlife field. (1F,W,Sp) ®

510. Wildlife Damage Management Principles. Explains current legal, ethical, and biological principles for the control and/or management of problem vertebrate species. (3F)

512. Techniques in Wildlife Damage Management. Comprehensive course presenting current methods for resolving wildlife damage problems through wildlife population manipulation, behavioral exploitation, and habitat alteration. (5Sp)

514. Selected Topics in Problem Wildlife Management. Seminar course with guest speakers who are authorities in various aspects of problem wildlife management. (4Sp)

516. Methods in Biotechnology: Cell Culture. Laboratory-intensive course in basic and applied methods of culturing cells (mammalian, insect, plant) and methods of fusing and transforming cells. Prerequisites: Biol 125 or ADVS 316 or equivalent, or permission of instructor. (3W)

519. Advanced Wildlife Techniques. Field procedures for determining sex and age, habitat utilization, capture and marking, necropsy, harvest surveys, and estimating populations. Includes mapping, orienteering, and field safety. Prerequisites: FW 386, 388; Stat 201. (3F)

520 (d623).[1] Predator Ecology and Management. Introduces students to interactions between predators and prey. They can apply this knowledge to unique problems of managing vertebrate predators. (3W)

524. Methods in Biotechnology: Protein Purification Techniques. Laboratory-oriented course designed to provide basic knowledge in protein purification, analysis, and its scale up. Prerequisites: Chem 370 or ADVS 316, or permission of instructor. (3Sp)

525. Habitat Relationships in Managed Forests. Ecological relationships, management concepts, and policy influencing fish and wildlife habitats in managed forests. (3F)

526. Methods in Biotechnology: Molecular Cloning. Laboratory-oriented course in molecular cloning techniques such as DNA cloning, genetic probes, PCR, DNA sequencing. Prerequisites: Chem 370 or Biol 319 and Micb 301 or equivalent, ADVS 316, or permission of instructor. (3F)

****527. Advanced Conservation Biology.** Principles of the management of small populations, including the effects of habitat fragmentation, demography, and genetics. (4F)

530. Genetics in Conservation and Management. Principles of genetics for conservation and population management, including effective population size, stock analysis, gene flow, founder effect, and biotic diversity. Recommended: Biol 319, 517, 525. (3W)

540. Ecosystem Concepts: Theory and Practice in Fisheries and Wildlife. Advanced course on the theoretical underpinnings and applications of principles of community and ecosystem ecology in terrestrial and aquatic environments. Prerequisite: FW 431. (5W)

***551. Water Pollution Effects/Assessment.** Review of biological and social problems associated with water pollution. Physiological effects of various toxicants on fish. Prerequisite: FW 460 or consent of instructor. (3F)

554. Principles of Fish Culture. The principles of fish culture, fish hatchery management, and nutrition of hatchery-reared fish. (3F)

555. Diseases of Fish. The common diseases of both cold and warm water fishes. Discussion of concept of diseases in fish populations. (3W)

560. Aquatic Ecology Laboratory. Field, laboratory, and data analysis approaches for measuring physical, chemical, and biological parameters in lakes and streams. Required field trip. Prerequisites: FW 460, Stat 201. (4Sp)

571. Principles of Fishery Management. Study of the development and application of fishery management principles and their historic, biological, societal, economic, and institutional bases. (3W)

575. Ichthyology. Ecology, classification, and life histories of native and introduced fishes. (5Sp)

****580. Quantitative Analysis of Vertebrate Populations.** Advanced course in wildlife and fisheries population dynamics. Introduces quantitative techniques in population estimation and prediction. (4W)

599. Case Studies in Fisheries and Wildlife. Review and discussion of case studies representing successes and failures in management of fisheries and wildlife resources. (3Sp)

Graduate[2]

601. Advanced Fisheries and Wildlife Program Administration. (3F)

605. Topics in Animal Behavior. (1-5)

***610. Concepts in Habitat Selection and Foraging Behavior.** Prerequisite: FW 386. (3F)

616. Animal Behavior Laboratory. (2)

****620. Ecology and Management of Large Herbivores.** (3W)

621. Selected Topics in Fish Physiology. (1-3F,W,Sp)

623 (d520). Predator Ecology and Management. (3W)

625. Graduate Internship/Co-op. (1-15F,W,Sp,Su) ®

627. Wildlife Habitat Evaluation, Planning, and Management. (5Sp,Su)

630. Ecology of Animal Populations. (4Sp)

635. Wildlife Damage Management Policy. (3W)

640. Waterfowl and Wetlands Seminar. (1-3F,W,Sp) ®

645. Landscape Level Patterns and Processes. (3F)

***650. Fishery Biology.** (4Sp)

****655 (f565). Production Biology in Fisheries Environments.** (4W)

661. Stream Ecology. (3Sp)

****675. Fish Ecology.** (3F)

680. Lentic and Lotic Ecosystems. (1-2)

***681 (f581). Sampling and Data Analysis for Biological Populations.** (4F)

685. Freshwater Invertebrate Ecology. (2F)

687. Ecology Seminar. (1) ®

***690 (f590). Ecology of Freshwater Wetlands.** (4F)

691. Directed Study. (1-5) ®

***693. Presentation and Publication in the Life Sciences.** (3Sp)

695. Department Fisheries and Wildlife Graduate Seminar. (1F,W,Sp) ®

697. Thesis Research. (1-15) ®

699. Continuing Graduate Advisement. (1-3) ®

782. Seminar in Animal Populations. (1)

797. Dissertation Research. (1-15) ®

799. Continuing Graduate Advisement. (1-3) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing; parenthetical numbers preceded by an *f* are the *former* course numbers.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

*Taught 1996-97.

**Taught 1997-98.

Department of

Forest Resources

College of Natural Resources

Head: Professor Terry L. Sharik
Office in Natural Resources 208, 797-3219

Professors G. Jay Gogue, James J. Kennedy, Richard S. Krannich, Ronald M. Lanner, James N. Long, H. Charles Romesburg; **Nontenure-track Professor** Jesse A. Logan (USDA Forest Service Intermountain Research Station); **Adjunct Professors** Norbert V. DeByle, (USDA Forest Service Intermountain Research Station, retired), Charles C. Grier, (Colorado State University), Roy C. Sidle (Geological Survey of Denmark); **Professor Emeritus** Theodore W. Daniel; **Associate Professors** Frederick A. Baker, Dale J. Blahna, Michael J. Jenkins, Michael R. Kuhns, Robert J. Lilieholm, David W. Roberts; **Research Associate Professor** Leila McReynolds Shultz; **Adjunct Associate Professor** John L. Crane, Jr., (Utah National Guard); **Assistant Professors** Mark W. Brunson, Joanna L. Endter-Wada, Helga Van Miegroet; **Nontenure-track Assistant Professor** Barbara J. Bentz (USDA Forest Service Intermountain Research Station); **Adjunct Assistant Professors** Janet A. Anderson (USU Libraries); Jeffrey J. McDonnell, (SUNY—College of Environmental Science and Forestry), John F. McLaughlin (Teton Science School), Nancy Huffman Shea (Teton Science School), Joseph P. Stringer (U.S. Department of Agriculture); **Adjunct Instructor** J. Keith Schnare (USDA Forest Service, Intermountain Region); **Senior Lecturer** Michael F. Butkus

Degrees offered: Bachelor of Science (BS), Master of Science (MS), Master of Forestry (MF), and Doctor of Philosophy (PhD) in Forestry; BS, MS, and PhD in Recreation Resource Management; MF in Forest Management; MS and PhD in Ecology (Forest); BS in Environmental Studies (Interdisciplinary Natural Resources Program)

Areas of specialization: BS degree in Forestry has areas of emphasis in Forest Biology, Forest Management, Forest Recreation, Forest Watershed Management, Urban Forestry, Natural Resources Policy, and Computer Forestry; MS, MF, and PhD degrees in Forestry have specializations in Forest Biology and Forest Economics and Policy

Objectives

The major instructional goal of the Department of Forest Resources is to provide an excellent professional program in forest ecosystem management, with quality graduate programs in specific disciplines. To that end, the department continually evaluates and upgrades courses and curricula in response to changes in professional and governmental standards, makes effective use of University resources for instructional development, seeks to maintain a student-to-faculty ratio that allows for personalized instruction and advisement, provides adequate field experience as an integral part of professional undergraduate education, encourages and assists students in finding seasonal professional employment, seeks to integrate international students into the program through supplementary advising and tutoring, encourages students to become active in professional organizations, and seeks to attract and retain the highest quality undergraduate and graduate students. Other departmental goals are to generate new knowledge and to develop applications of current knowledge that will promote understanding of natural resource problems and aid in their solutions.

The department's curricula are aimed at providing a sound general education and a firm grounding in professional subjects. The Forestry and Master of Forestry curricula meet the accreditation standards of the Society of American Foresters. The department stresses education in biological, physical, and social sciences; humanities; mathematics and computer science; and communication. The forestry curriculum places emphasis on the biological and physical aspects of resource management, while the recreation curriculum places emphasis on the social aspects. These curricula provide a strong background in management science, planning, and policy analysis.

The environmental studies curriculum is designed for students who wish to acquire a broad understanding of human, natural resources, and environmental relationships, together with the technical background needed to understand environmental issues. In many ways, the curriculum provides a traditional "liberal arts education" with a strong natural resources emphasis. The curriculum has fewer requirements than the other majors and provides flexibility for the development of either specialization or breadth of content to match the student's interests.

Requirements for the Bachelor of Science

Forestry Curriculum

All forestry majors must take the forestry core and complete at least one departmentally approved specialization option or area of emphasis; 199 credits are required.

Freshman year: Biol 125, 126; Chem 111; Engl 101; Econ 200; FR 199; Geol 111 or Geog 113; Math 105; NR 101, 102; Chem 141 or Phyx 120; and Spch 105.

Sophomore year: NR 201; FR 300, 320, 321; FW 300 or RLR 300; Math 215; Biol 386; RR 300; Engl 200 or 201; Soil 358; WS 300; Stat 201; and Soc 102.

Summer Camp:[1] FR 301, 302, 303; RLR 298; Geog/WS 301.

Junior year: FR 325, 420, 465[2]; Geog 534; NR 360, 370, 380, 390; PolS 110; WS 420; and 8 or more credits of General Education courses, option courses, or electives.

Senior year: Ent 540 or FR 563[2]; FR 330, 425, 443, 445, 510, 527; and 14 or more credits of General Education courses, option courses, or electives.

Specialization Options: Approved departmental options in forestry require 14-18 credits:

Forest Management: FR 465[2], 563[2]; Ent 540[2], plus 7-10 additional credits approved by adviser.

Forest Watershed: WS 416, 475; CEE 343, plus one additional course approved by adviser.

Forest Recreation: RR 451, 510, 520; PRP 551.

Forest Biology: Bot 420, plus three additional courses approved by adviser.

Natural Resources Policy: 15-18 credits from following list: Econ 501, 556; PolS 410, 418, 464; Soc 462, 463.

Computer Forestry: CS 171, 172, 241, 525; BA 308.

Urban Forestry: 14-18 credits from following list: Ent 540; FR 563, 565; PlSc 261, 360.

Minor Option: Students may choose any University-approved minor (18-21 credits) outside the Department of Forest Resources.

Recreation Resource Management Curriculum

All recreation resource management majors must complete the natural resources core courses, summer camp, and the recreation resource management core; 199 credits are required.

Freshman year: Biol 125, 126; Chem 111; Engl 101; FR 199; Geol 111 or Geog 113; LAEP 103; NR 101, 102; PolS 110; Soc 102; RR 250; Spch 105; and 3 or more credits of General Education courses or electives.

Sophomore year: NR 201; Econ 200; FR 300, 320; FW 280, FW 300 or WS 300[3]; Biol 386; Math 105 or 215; Stat 201; RR 300; Soil 358; Engl 200 or 201.

Summer Camp:[1] FR 301, 302, 303; RLR 298; and Geog/WS 301.

Junior year: FR 325, 420, 425, 465[2]; NR 360, 380, 390; RR 451, 510, 520; Geog 534; Soc 350; RLR 300[3].

Senior year: FR 563 or Ent 540[2]; FR 443, 510; FR 527 or WS 420; FR 553 or MHR 360 or FR 555; and 15 or more credits of General Education courses or electives.

Option courses: Students must complete 3 credits from among BA 451; Soc 312, 342, 361, 462, or 463; and 3 credits from among RR 346, PRP 406, 551, 552, or 555.

Environmental Studies Curriculum

The curriculum is divided into three areas: (1) a required core, (2) an area of emphasis, or option, selected by the student, and (3) free electives. For graduation in environmental studies, 186 credits are required.

Core. Geog 113 or Geol 111; Geog 534, 575; PolS 110, 410; Phil 327; Soc 102; Math 105; Stat 201; Spch 105; Engl 101, Engl 200 or 201; Econ 200; FR 199, 300, 325, 510; NR 101, 102, 201, 360, 380, 390; Biol 125, 126, 386; Chem 111; Soil 358; RR 300; RLR 300; FW 280, 300; WS 300.

Areas of Emphasis: The area of emphasis requirement can be fulfilled by: (1) completing upper-division credits for any approved USU minor; (2) completing a program of study designed by the student in cooperation with a faculty adviser; **or** (3) selecting one of three options in environmental management and policy, environmental interpretation/communication, or environmental assessment and analysis.

[1]Camp may be taken after the freshman year if Biol 125 and Math 105 have been completed and the student has a cumulative GPA of at least 2.80.

[2]Forestry and recreation students must take FR 465 or Ent 540 or FR 563. Forestry students in the Forest Management option must take all three courses.

[3]Recreation students must take **two** of RLR 300, WS 300, and FW 300.

Minors in Forest Resources

The department offers two minors which are open to all University majors **except** students majoring in Forestry or Recreation Resource Management.

The **Recreation Resource Minor** consists of 20 credits. Required courses include RR 300, 451, 510, 520; and 6 credits from the following list: RR 250, 346, PRP 406, 551, 552, FR 420, 510, Soc 462, NR 390.

The **Environmental Studies Minor** consists of 24 credits. Required courses include FR 300, 420, 510, Biol 386, NR 390; and two of the following courses: RR 300, WS 300, FW 300, and RLR 300.

Graduate Study

The Department of Forest Resources offers the Master of Science, Master of Forestry, and Doctor of Philosophy degrees. See the *Graduate Catalog* for prerequisites and further information.

Forestry Courses

Natural Resources courses 101 through 645 are listed under the College of Natural Resources, pages 55-56.

199. Professional Orientation Seminar. Introduction and orientation to forestry, outdoor recreation, environmental studies, watershed science, and related professional careers. Education, curricula, faculty, professional societies, and employment opportunities. (1F)

300. Principles of Forestry. Historic and cultural foundation of present forest use. Current use and management of America's forests emphasizing problems of growth, multiple-use management, and ownership. Contemporary issues examined, such as clear cutting and wilderness area management. (3W)

301. Forest Surveying. Practical field problems in surveying methods employed in wildland management. Traverse and topographic methods. Lab fee. (3 Summer Camp)

302. Forest Practice. Field study of timber volume and inventory techniques, succession, silviculture, and compartmental examination. Related uses of wildlands. Lab fee (4 Summer Camp)

303. Utilization Field Trip. Field trip to lumber, paper, and logging activities, forest management, and silviculture in western forests. Required in summer camp. Fee: about $70 for travel plus daily expenses. (2 Summer Camp)

320. Dendrology. Taxonomy, nomenclature, identification, geography, and ecological characteristics of major North American forest trees. (4F)

321. Tree Growth and Structure. Study of the growth processes, morphology, wood anatomy, and reproduction of forest trees. (4W)

325. Forest Ecology. Principles and concepts of forest ecology: forest environments, woody plant ecophysiology, forest ecosystem structure and function, forest community ecology. Forest ecology of the Rocky Mountains. Prerequisite: Biol 386 or FW 386. (4F)

330. Forest Measurements. Measurements of timber in log, tree, and stand; log rules and scaling; statistical methods useful in analyzing forest data; timber cruising practices. Prerequisites: summer camp; NR 201, 360, 370; Math 215; Stat 201. (5Sp)

365. Basic Wildfire Suppression. Trains individuals in basic wildfire behavior and suppression and qualifies the student to function as a member of a wildfire suppression crew. (2Sp)

420. Introduction to Forest Resource Economics. Application of economic concepts to private and public sector forest decisions. Investment analysis, benefit-cost analysis, optimal rotation, valuation of nonmarket forest outputs. Recommended: NR 380. (4W)

425. Silviculture. The application of principles and concepts from forest ecology to control the establishment, composition, structure, and growth of forests to achieve the objectives of management. Prerequisite: FR 325. (5W)

443. Forest Management. Physical and economic factors influencing forest regulation for sustained timber yields; management and decision making; timber and multiple-use management plans and planning. Recommended: FR 325, 330, 420. (4Sp)

445. Logging. Elements of timber harvest systems examined with respect to utilization of resources and minimizing impacts on soil and water. (3W)

465. Wildland Fire Management and Planning. Fire as a resource management tool with applications in forestry, range, and wildlife fields. Fire policy, prescription planning, economics, fire behavior, and management. (3Sp)

480. Undergraduate Research. Individual or team research. Prerequisite: adviser approval. (1-5F,W,Sp,Su) ®

491. Directed Study. (1-6F,W,Sp,Su) ®

498. Co-op Education and Internship. Directed and evaluated undergraduate cooperative education or internship work experience with public or private organizations. (1-6F,W,Sp,Su) ®

510. Human Dimensions of Natural Resource Management. Provides an understanding of human influences on resource use and management and methods for changing human behavior and for incorporating social values in resource management and policy decisions. (3W)

524. Principles and Practices of Intensive Silviculture. Designed to familiarize student with silvicultural methods appropriate for intensive forest management including artificial regeneration and the assessment and control of basic growth and yield relations. (4Sp)

527 (d628).[1] Properties and Management of Wildland Soils. Biological, chemical, and physical properties of wildland soils; site productivity and classification of wildlands; techniques for managing wildland soils and the consequences of management. (3F)

****534. Remote Sensing of Natural Resources.** Applications of remote sensing to natural resource management; interpretation of aerial photos, satellite and radar imagery; digital analysis; vegetation and soil mapping; photogrammetry; survey techniques. (4F)

535. Forest Biology Seminar. Regularly scheduled seminar by faculty and biologists from other institutions on topics related to forest biology. (1W) ®

553. Natural Resource Administration. Organizational structures and processes common in natural resources administration on federal and state level, and how they impact career development and land management. (3F)

555. Environmental and Natural Resources Law and Policy. Regulation of water, air, land, and fish and wildlife resources. Federal legislation and court cases are emphasized. Current issues and state law are also considered. (2-3Sp)

***563. Forest Pathology.** Nature, cause, and control of diseases affecting forest trees. Prerequisites: Biol 126; Bot 560 (may be concurrent). Two lectures, two labs. Also listed as Bot 563. (4W)

565. Urban Forest Management. Biological, administrative, and social aspects of managing urban forests; field exercises in inventory and planning. (4)

566. Shade Tree Pathology. Identification, biology, and management of urban tree diseases of regional and national importance. (5)

571. Forest Vegetation and Ecology of Rocky Mountains. Ecology of principal taxa of Rocky Mountain forests. Regional approach to community composition, dynamics, and distribution. Effects of disturbance. Vegetation classification by habitat types. Prerequisites: Biol 386, FR 320. (4)

598. Co-op Education and Internship. Directed and evaluated graduate cooperative education or internship work experience with public or private organizations. (1-6F,W,Sp,Su)

Graduate[2]

625. Advanced Silviculture. (3)

628 (d527). Properties and Management of Wildland Soils. (3F)

630. Agroforestry. (3Sp)

641. Current Issues in Multiple-use Forest Management. (3)

642. Advanced Forest Management. (3Sp)

653. Natural Resource Administration. (3)

655. Directed Studies in Urban Forestry. (1-3F,W,Sp,Su)

656. Directed Studies in Forest Pathology. (1-3F,W,Sp,Su)

657. Directed Studies in Shade Tree Pathology. (1-3F,W,Sp,Su)

665. Forest Biology. (3F)

670. Forest Ecology. (3W)

671. Perturbation Ecology in Forested Systems. (3Sp)

672. Forest Biogeochemistry. (3Sp)

680. Forest Science Seminar. (1-3) ®

***681. Natural Resource Research Design.** (5F)

687. Ecology Seminar. (1) ®

691. Directed Study. (1-6) ®

697. Thesis Research. (1-10) ®

699. Continuing Graduate Advisement. (1-3) ®

780. Forest Science Seminar. (1-3) ®

797. Dissertation Research. (1-10) ®

799. Continuing Graduate Advisement. (1-3) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

*Taught 1996-97.

**Taught 1997-98.

Recreation Resource Management Courses

IO 250. Wilderness in America. Review of the social, cultural, and historic foundations of wilderness concepts, public agencies responsible for wilderness management, and allocation-management problems, including several case studies. (3F)

300. Recreational Use of Wildlands. Factors responsible for recreational use, legislative programs, philosophical concepts, and descriptions of recreation agencies involved in wildland recreation management. (3F)

346. Ski Mountaineering. Introductory course dealing with snow safety, personal survival, winter mountaineering and field skills, search and rescue techniques, avalanche hazards, and winter equipment selection and use. (3W)

451. Interpretive Planning. Analysis and development of interpretive programs for recreational areas. Techniques of natural history interpretation. Evaluation and planning for visitor information programs. (3W)

480. Undergraduate Research. Individual or team research. Prerequisite: adviser approval. (1-5F,W,Sp,Su) ®

491. Directed Study. (1-6) ®

498. Co-op Education and Internship. Directed and evaluated undergraduate cooperative education or internship work experience with public or private organizations. (1-6F,W,Sp,Su)

510. Outdoor Recreation Behavior. Examination of the cultural, social, and psychological influences on human behavior in a wildland recreation context and their management implications. (4F)

520. Recreation Resource Policy. Development of recreation policy for public lands. Analysis of policy implications for planning and management. Implementation of recreation planning strategies. (4Sp)

530. Tourism Development. Examines tourist behavior as an element in economic development and land use. Addresses characteristics of tourist regions and services in both a national and international context. (3)

598. Co-op Education and Internship. Directed and evaluated graduate cooperative education or internship work experience with public or private organizations. (1-6F,W,Sp,Su)

Graduate[1]

651. Forest Recreation. (3Sp)

652. Forest Recreation II. (3W)

680. Outdoor Recreation Seminar. (1-3W) ®

691. Directed Study. (1-6F,W,Sp,Su) ®

697. Thesis Research. (1-10F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-3F,W,Sp,Su) ®

780. Outdoor Recreation Seminar. (1-3W) ®

797. Dissertation Research. (1-10F,W,Sp,Su) ®

799. Continuing Graduate Advisement. (1-3F,W,Sp,Su) ®

[1]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Department of
Geography and Earth Resources
College of Natural Resources

Head: Professor Allan Falconer
Office in Natural Resources 201, 797-1790

Professors Clifford B. Craig, Derrick J. Thom; **Associate Professors** Ted J. Alsop, R. Douglas Ramsey; **Assistant Professors** Helen Ruth Aspaas, Michael P. O'Neill, John C. Schmidt; **Research Assistant Professors** Sharon L. Ohlhorst, David S. Winn

Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA), Master of Science (MS), and Master of Arts (MA) in Geography

Objectives

The undergraduate program provides a broad background in the systematic fundamental themes of geography—human (cultural), physical, and regional geography—with particular focus on environmental and earth-resources geography. In addition, students will acquire technical geographic analysis skills: map and airphoto interpretation, cartographic design, geographic information analysis, remote sensing, and field/statistical research methods. These fundamental conceptual and technical skills prepare the student for graduate school or professional employment in the public or private sector.

Besides acquiring fundamental geographic skills and knowledge, students study in a systematic, regional, or technical area of geography. Students may choose among courses both outside and within the department. Faculty within the department conduct research and teach specialized courses in a diversity of systematic physical geography areas, including geomorphology, water resources, biogeography, climatology, and human-environment interaction. Courses with human/cultural geographic themes, such as cultural ecology, international rural development, geographic and environmental education, and political, economic, and settlement/population geography, are also offered. Students wishing to focus on regional studies may choose from courses on Europe, Africa, Latin America, the Pacific Rim, North America, the Middle East, and Utah, as well as ecosystem-oriented regions such as mountain lands or arid/semi-arid lands.

The Department of Geography and Earth Resources maintains laboratories with state-of-the-art equipment for research and teaching in the fields of satellite remote sensing, digital image processing, automated mapping, geographic information systems, map analysis, and environmental modeling. Geography majors can apply for scholarships, internships, and assistantships offered by the Geography and Earth Resources Department and the College of Natural Resources, or may qualify for part-time employment with ongoing research projects receiving funding in the Geography and Earth Resources Department.

Requirements

Every geography major is required to complete 48 credits in geography courses. A grade of *C* or better is required in any geography course to meet the requirements for a major, minor, teaching major, or teaching minor in geography. A 2.5 grade point average in geography courses is required for graduation.

Major in Geography. Required introductory courses include Geog 101, 103, 113, and 171. Required methods and techniques courses include Geog 185, 386, and 588. Students also take Math 105; Stat 201; and NR 101, 102, 201, 360, and 370. All electives should be geography courses at or above the 300 level.

The geography program offers the student an opportunity to study physical, human, and regional geography and to study particular methods and techniques. Students interested in one or more of these areas should consult their adviser for guidance in the selection of appropriate electives, including courses from other departments.

Minor in Geography (30 credits minimum). A geography minor requires four courses chosen from Geog 101, 103, 113, 171, and 223; plus Geog 185 and three additional courses at or above the 300 level, including both systematic and regional courses.

Teaching Major in Geography. A total of 48 credits is required, as follows: Introductory required courses—Geog 101, 103, 113, 171, and 223; required regional course—Geog 520 (Utah); required methods and techniques courses—Geog 185 and 580. The remaining credits are elective and should be taken from the systematic and regional fields.

Teaching Minor in Geography (30 credits). Geog 101, 103, 113, 171, 185, and 580 are required. Teaching minors are encouraged to take additional courses from both regional and systematic areas of geography.

Geography Courses

SS 101. Human Geography. A spatial study of human behavior within selected socio-cultural setting (i.e., value systems, cultural landscapes, rural-urban behavior, and human appetites). (5F,W)

SS 103. World Regional Geography. A survey of world cultural regions with an analysis of political, economic, and resource patterns in their physical setting. (5W,Sp) ©

PS 113. Physical Geography. An introduction to physical geography consisting of four lectures and one demonstration each week. A geographic analysis of the processes and distribution of the elements of the natural environment, i.e., atmosphere, lithosphere, biosphere, and hydrosphere. (5F,W,Sp) ©

IO 171. Human Impact on Environment. Assessment of natural and man-related processes that together act to modify the environment. Regional variations will be considered. (5)

185. Map Interpretation. A basic survey of the philosophical, theoretical, and practical nature of maps with an emphasis on map reading, interpretation, and analysis. (3)

223. Economic Geography. Geographic analysis of world patterns of economic activities, i.e., production, consumption, and exchange, with emphasis on factors of industrial location. (3)

225. Introductory Cooperative Internship. An introductory-level educational work experience in a cooperative education position approved by the department. Credit arranged. (1-6F,W,Sp,Su) ®

301. Geography/Watershed Practices. Field study of geomorphology, hydrology, and aquatic ecosystems. Field and laboratory study of Geographical Information Systems and Global Positioning Systems. Lab fee. (2 Summer Camp)

343. Political Geography. The relationship between earth and state. World political phenomena studied from a geographic point of view including international boundaries, territorial seas, and landlocked states. (3)

351. Geography of Population and Settlement. The impact of technology and population growth on natural resources. Attention is drawn to the distribution of population and settlement in relation to the environment. (3)

360. Geomorphology. Geomorphic processes, origin of land forms, characteristics of surficial (unconsolidated) deposits. Emphasis on glacial, fluvial, lacustrine environments; surficial geologic mapping. Four lectures and one lab per week. Prerequisites: Geol 101, 105, 111, or Geog 113. (5F)

361. Geography of Urban Planning. Analysis of the organization and interrelationships of urban-city space. Emphasis on spatial planning of rural-urban environments for improved quality of life. (3)

381. Physiography of the United States. Study of the physiographic regions of the United States as produced by mass wasting, fluvial, aeolian, glacial, and coastal processes. Regional landscape differences are also studied. (3)

PS 382. Regional Climatology. Descriptive treatment of regional and world climates with emphasis on the geographical features and the associated physical mechanisms that produce different climatic regions. (3)

386. Mapping and Graphic Design. Preparation and design of location maps and maps of study areas to publishable product. Emphasis placed on the effective communication of data through appropriately designed maps, supported by use of user-friendly computer mapping software. (3F)

390. Statistical and Spatial Analysis in Geography. Introduction to the scientific approach in analyzing geographic data. Emphasizes sampling methods, statistical tests, and measures of spatial variation applied to geography. (3)

416 (d616).[1] Hillslope Geomorphology. Focuses on movement and storage of sediment on hillslopes and in small channel systems. Develops an understanding of processes responsible for shaping hillslopes and examines effects of land management on those processes. Prerequisites: Geog 113, Geol 111, or WS 300. (4F)

425. Advanced Cooperative Internship. Cooperative education/work experience; increased complexity and a more professional level of experience as student advances toward completion of the program. Credit arranged. (1-15) ®

429 (d629). Spatial Perspectives on Development. Spatial economic theory, spatial quantitative methods, and issues related to regional planning are examined in the context of developing societies. (3W)

465 (d665). Developing Societies. Theories and experiences of social, political, and economic development with emphasis on the problems of developing countries. (3W)

480. Undergraduate Research. Individual or team research. Prerequisite: adviser approval. (1-5F,W,Sp,Su) ®

510. Methods of Ecological and Environmental Mapping. Introduces the concept of mapping in the field from serial photography and from satellite data to mapping environmental regions and establishing a GIS data base. (3F)

IO 511 (d611). Environmental Education. Acquaints students with the nature of our natural resources, principles for intelligent stewardship, and procedures for incorporating this knowledge into learning situations. (4Sp)

515. Fluvial Geomorphology. Broadly examines the movement of water and sediment through stream channels, the erosional and depositional processes associated with this movement, and landforms produced by these processes. Prerequisites: Students must have completed Geog/Geol 360 and Math 220, 221; or must have obtained permission of the instructor. (4Sp)

520 (d620). Regional Geography. Analysis of the physical and cultural geography of different regions of the world. Can be repeated for different regions. (3F,W,Sp,Su) ® ©

524 (d624). Transportation Planning. Urban and regional transportation planning process, data collection and analysis, travel demand modeling, land use, transportation interaction, computer applications. (3W)

530 (d630). Global Environments. Study of the major climatic, vegetation, and land form regions which provide the setting for global issues, such as deforestation in the tropics and acid rain. (3)

534 (d634). Aerial Photo Interpretation. Determination of location, character, and nature of objects imaged on aerial photographs. Use of precise measurements from aerial photographs for identifying, locating, and describing imaged objects. (3)

541 (d641). Synoptic Meteorology. Study and analysis of the synoptic structure of climate, with special interest in geographical distributions and practical prediction of global climates. (3W)

555 (d655). Environment, Resources, and Development Policy. Environment, natural resources, and development policy in Third World, emphasizing sustainable development. Discussion of farming systems, agro-pastoralism, desertification, rural health, and land use. (3F)

570 (d670). History of Geographic Thought. Designed to acquaint students with the aims, methods, and accomplishments of geography as a professional field and a discipline in the past, present, and future. (3)

575 (d675). Geographic Applications of Remote Sensing I. Provides information needed to understand and apply the techniques of remote sensing to a wide range of resource applications. (3)

576 (d676). Remote Sensing II. Advanced techniques in the analysis of earth feature space using remotely-sensed imagery and data in a digital format. Individual projects will employ and/or develop research models. (3)

580 (d680). Teaching Geography. Designed to assist the classroom teacher in the presentation of geographic information. Techniques, methods, and sources of data will be stressed. (3)

581 (d681). Geography Education Workshop. Designed to provide specialization for geography educators through the workshop format. Selected geographic content, methods, and pedagogy will be presented and translated into materials to be designed for K-12 classrooms. (1-6)

585 (d685). Cartographic Design. Principles and techniques used in design and construction of maps, charts, and map projections. (3F)

588. Geographic Methods. Designed to acquaint the student with techniques and resources utilized in geographic research. Projects requiring this methodology will be required relating to problems in Cache Valley. (3)

590. Geography Field Practicum. A course for students in geography who are involved in field research and/or internships. (1-6) ®

593 (d693). Geographic Information Systems. Fundamentals of geographic information systems, data structures, data input and output, data manipulation, and analysis. (3W)

594 (d694). Geographic Information Analysis. Advanced techniques of spatial analysis on digital data bases using various data formats separately and in combination. (3Sp)

598 (d698). Special Topics. Designed to provide special insight and in-depth study of topics of present concern. (1-6) ®

599. Readings and Conference. (1-3) ®

Graduate[2]

611 (d511). Environmental Education. (4Sp)

616 (d416). Hillslope Geomorphology. (4F)

620 (d520). Regional Geography. (3F,W,Sp,Su) ®

624 (d524). Transportation Planning. (3W)

625. Graduate Cooperative Internship. (1-15) ®

629 (d429). Spatial Perspectives on Development. (3W)

630 (d530). Global Environments. (3)

634 (d534). Aerial Photo Interpretation. (3)

641 (d541). Synoptic Meteorology. (3W)

655 (d555). Environment, Resources, and Development Policy. (3F)

665 (d465). Developing Societies. (3W)

670 (d570). History of Geographic Thought. (3)

675 (d575). Geographic Applications of Remote Sensing I. (3)

676 (d576). Remote Sensing II. (3)

680 (d580). Teaching Geography. (3W)

681 (d581). Geography Education Workshop. (1-6)

682. Geography and Field Practicum. (1-6) ®

685 (d585). Cartographic Design. (3F)

687. Ecology Seminar. (1F) ®

688. Advanced Geographic Methods. (3Sp)

689. Thesis Design. (3F)

691. Independent Research. (1-6) ®

692. Graduate Seminar. (1-3) ®

693 (d593). Geographic Information Systems. (3W)

694 (d594). Geographic Information Analysis. (3Sp)

697. Thesis Research. (1-15) ®

698 (d598). Special Topics. (1-6) ®

699. Continuing Graduate Advisement. (1-3) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

Department of
Geology

College of Science

Head: Associate Professor Donald W. Fiesinger
Office in Geology 205, 797-1273

Professors W. David Liddell, Robert Q. Oaks, Jr.; **Professor Emeritus** Clyde T. Hardy; **Associate Professors** James P. Evans, Peter T. Kolesar; **Research Associate Professor** James P. McCalpin; **Assistant Professors** Susanne U. Janecke, Darrell S. Kaufman, Thomas E. Lachmar

Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA), and Master of Science (MS) in Geology; MS in Ecology (Geology)

Objectives

Geology is the study of the planet Earth, the materials of which it is made, the processes that act on these materials, the products formed, and the history of the planet and its life forms since its origin. Geology considers the physical forces that act within and on the Earth, the chemistry of its constituent materials, and the biology of its past inhabitants as revealed by fossils. Geologists integrate biology, chemistry, engineering, mathematics, and physics in the study of our natural surroundings. The knowledge thus obtained is used by geologists to explore for energy, mineral, and water resources, identify geologically stable sites for major structures, and to provide foreknowledge of some of the dangers associated with the mobile forces of a dynamic Earth. Geologists provide fundamental information required by modern society to plan for cultural and industrial development, reduce geological hazards, identify potential resources, and assist in the design of waste disposal facilities.

The Department of Geology prepares students for professional careers in the geosciences and provides the background required for advanced studies. The department offers four options of study to meet the growing demand for geoscientists with training in general geology, hydrogeology-engineering geology, geoarchaeology, or composite earth science teaching. All options provide exposure to the sciences and an appreciation of our physical surroundings. The BS program in Geology meets the curriculum standards established by the American Institute of Professional Geologists. Requirements for the composite earth science major meet or exceed the standards of the National Science Teachers Association.

The Department of Geology is housed within the Geology Building, which is located at the northeast corner of the Old Main Quad. Renovated in 1988-89, the Geology Building provides spacious well-equipped teaching labs, classrooms, and facilities for the department, including a display and study area for students, document room, map room, preparation facilities, and research labs.

General College of Science Requirements

Orientation Requirement. All students graduating from the College of Science are required to take the college orientation course: Sci 150, Science Orientation.

Written Communications Requirement. In addition to the University's written communication requirement, the college requires a junior level writing class. This requirement may be filled by completing either English 301 or 305.

Bachelor of Science Core Requirements. Students working toward the Bachelor of Science degree in any major within the College of Science must complete the following:

A. Math 220 and 221.
B. Either CS 160 or Stat 201.
C. One of the following sequences: (1) Biol 125 and either Biol 126 or Biol 127; (2) Chem 121, 122, and 124; (3) Geol 111 and 200; (4) Phyx 221 and 222.

Majors in Biology, Chemistry and Biochemistry, Geology, and Physics **cannot** satisfy requirement *C* by taking a sequence in their own discipline. Higher level courses than the ones listed in the three categories above may be substituted in some instances. Approval for any substitutions must be obtained in advance.

Note: The above Bachelor of Science requirements are **not** in effect for the Bachelor of Arts degree.

Requirements

Departmental Admission Requirements. Admission requirements for the Department of Geology are the same as those described for the University.

Bachelor of Arts Degree. For a BA in Geology, the foreign language requirement must be satisfied in addition to the Bachelor of Science Geology requirements.

Bachelor of Science Degree. Four options of study are available for a BS in Geology: General Geology, Hydrogeology-Engineering Geology, Geoarchaeology, and Composite Earth Science Teaching.

For a BS in Geology (General Geology option), the following courses are required: Geol 111, 200, 305, 310, 360, 370, 405, 410, 416, 430, 470, 520, 540; Chem 121, 122, 123, 124, 160; Phyx 221, 222, 223; Stat 301 or CS 160; Biol 257; Math 220, 221. Students must also select 11-12 credits from the following: Geol 516, 531, 532, 536, 544, 548, 552, 554, 562, 564, 568, 580.

For a BS in Geology (Hydrogeology-Engineering Geology option), the following courses are required: Geol 111, 200, 305, 310, 360, 370, 470, 520, 540, 548; Math 220, 221, 222, 321, 322; CEE 343 (or CEE 305 and 430), 350; Chem 121, 122, 123, 124,

160; Phyx 221, 222, 223; Stat 301; Soil 513 (or Soil 358 and 359); Engr 103, 200, 202, 204.

For a BS in Geology (Geoarchaeology option), the following courses are required: Geol 111, 200, 305, 310, 360, 370, 430, 470; Anth 110, 231, 411, 412, 430, 433, 436; Chem 121, 122, 123, 124, 160; Math 220, 221; Stat 301 or CS 160; Biol 125, 126, 127.

For a BS in Geology (Composite Earth Science Teaching), the following courses are required: Geol 111, 200, 250, 305, 310, 360, 370, 470; Phyx 100, 216, 221, 222, 223; Chem 121, 122, 123, 124, 160; NR 511 or FW 284; Bmet 200 or 530; FW 260; Math 220, 221; Stat 201; Sci 430; ScEd 201, 301, 302, 330, 335, 404, 450, 460, 510; Psy 366; SpEd 301; InsT 445, 447. Students must also complete 7-8 credits from one of the following sets of courses: Biol 257 and Geol 430; Geol 405 and 416; Geol 520 and 564; Geol 540 and 548.

The Geology Major Requirement Sheet, available from the Department of Geology office, Geology Building 205, provides a recommended plan of study for each of these options. Some required courses, however, are only offered every other year. It is imperative that students remain in contact with the Geology adviser on a regular basis (at least every fall and spring quarter) to avoid problems in scheduling these required courses.

Geology Minor. A minimum of 24 credit hours is required for an approved minor in Geology. Required courses are Geol 111 (preferred) or 101 or 105, and 200. Elective courses must be 300-level or above.

Geology Teaching Minor. Completion of the Geology teaching minor satisfies most requirements for the Earth Science endorsement of the Utah State Office of Education. Required courses are Geol 111 or 105 or 101, 200, 305, 360, 370, and Geol 430 or 470.

Composite Teaching Major. The Composite Teaching Major in Earth Science prepares teachers of earth science at the secondary school level. Those students who undertake this option should be aware that state certification is required of secondary education teachers. The composite earth science teaching option fulfills the requirements that provide eligibility for certification. Certification requirements vary from state to state and students should investigate the requirements for the states in which they intend to seek employment. Advising for the professional education component and State of Utah secondary education certification is provided by the USU Department of Secondary Education.

Senior Thesis. Geology majors in good academic standing may elect to complete a senior thesis. This is an endeavor which normally spans a year in its preparation and presentation. Senior thesis credits may be applied toward the elective requirements in the General Geology option. For further information, students should contact their Geology adviser or the Geology department head.

Geology Honors. Geology majors with a minimum GPA of 3.30 may elect to complete the requirements for the Geology Honors degree option. This departmental recognition is separate from the University Honors Program. For further information, students should contact their Geology adviser or the Geology department head.

Field Trips and Labs. Most geology courses have required laboratories and/or field trips. Those enrolled are expected to dress properly for the conditions and observe safety precautions issued by the instructors. Most courses require modest lab fees.

Graduate Study

Master of Science Degree. The Department of Geology offers advanced study and research leading to the Master of Science degree.

Ecology Curriculum. The Department of Geology collaborates with the USU Ecology Center in offering an interdepartmental curriculum in ecology (physical).

Geology Courses

PS 101. Introductory Geology. Physical processes that shape the Earth, and physical and biological history of the planet. Four lectures and one lab per week. (5F,W,Sp,Su) ©

PS 105. Environmental Geology. Geologic processes and hazards affecting humans. Topics include: earth resources, earthquakes, volcanos, landslides, floods, waste management, and global changes. Four lectures and one lab per week. (5)

PS 111. Physical Geology. Physical processes, both internal and external, that shape the Earth. Relationship between geology and other physical sciences emphasized. Four lectures and one lab per week. (5F,W,Sp)

PS 200. Earth History. Physical and biological history of the Earth as revealed by the geologic record. Interpretive techniques. Three lectures and one lab per week. Prerequisite: Geol 101 or 105 or 111. (4Sp) ©

225. Introductory Internship/Co-op. Introductory educational work experience. (1-6F,W,Sp,Su) ®

250. Geology Field Excursions. Geologic features and processes observed in the field. Prerequisites: Geol 101 or 105 or 111 and permission of instructor. (1-3F,Sp,Su) ®

305. Mineralogy. Identification of minerals by physical and chemical properties. Introduction to crystallography and crystal chemistry. Three lectures and two labs per week. Prerequisites: Geol 111, Chem 123 and 160. (5F)

310. Sedimentation and Stratigraphy. Sedimentary environments and processes, stratigraphic units and principles, methods of sedimentary and stratigraphic analysis. Three lectures and one lab per week. Prerequisite: Geol 200 or permission of instructor. (4F)

360. Geomorphology. Geomorphic processes, origin of land forms, characteristics of surficial (unconsolidated) deposits. Emphasis on glacial, fluvial, lacustrine environments; surficial geologic mapping. Four lectures and one lab per week. Prerequisite: one of Geol 101, 105, 111; or Geog 113. (5F)

370. Structural Geology. Interpretation of deformed rocks using techniques of modern structural analysis, emphasizing the relationship between mechanics, mechanisms, and geometries of deformation. Three lectures and two labs per week. Prerequisites: Geol 111, Phyx 221; or permission of instructor. (5W)

405. Optical Mineralogy and Petrography. Introduction to the theory of optical crystallography. Determination of minerals by using the petrographic microscope. Three lectures and one lab per week. Prerequisites: Geol 305; Phyx 223 recommended. (4W)

410. Sedimentary Petrology. Classification and origin of sedimentary rocks with emphasis on mineral composition. Three lectures and one lab per week. Prerequisites: Geol 305, 310, and 405. (4Sp)

416. Igneous and Metamorphic Petrology. Classification and origin of igneous and metamorphic rocks with emphasis on mineral composition. Three lectures and one lab per week. Prerequisites: Geol 305 and 405. (4W)

425. Advanced Internship/Co-op. Advanced educational work experience. (1-15F,W,Sp,Su) ®

****430. Paleontology.** Classification and evolution of invertebrates and microfossils. Use of fossils as stratigraphic and paleoenvironmental indicators. Three lectures and two labs per week. Prerequisites: Geol 200; Biol 127 or 257. (5Sp)

470. Geologic Field Methods. Basic methods of field geology including recognition of geologic features, interpretation and preparation of geologic maps and cross sections. One lecture and two labs per week. Prerequisite: Geol 370. (3Sp)

490. Special Problems. Directed study of selected topics. Written report required. (1-6F,W,Sp) ®

****516 (d616).[1] Igneous and Metamorphic Petrography.** Classification and description of igneous and metamorphic rocks utilizing petrographic microscope. One lecture and two labs per week. Prerequisite: Geol 416. (4Sp)

***520. Geology Field Camp.** Integrative field activities to provide in-depth skills and knowledge of the methods of field geology. Prerequisites: Geol 305, 310, 360, 370, 470; Geol 410, 416, 430 recommended; or permission of instructor. (5Su)

***531 (d631). Global Geophysics.** Fundamentals of the physics of the Earth's interior and the theory of plate tectonics; recognition of large-scale crustal deformation and plate interactions; tectonic development of North America. Three lectures and one lab per week. Prerequisites: Geol 370 and Phyx 222, or consent of instructor. (4F)

****532 (d632). Tectonics of Orogenic Belts.** Survey of tectonic styles and processes along active plate margins; tectonic evolution of the North American Cordillera. Two lectures and one lab per week. Prerequisites: Geol 310 and 370. (4F)

***536 (d636). Paleoecology.** Use of fossils in the interpretation of ancient environments. Techniques for the analysis of paleocommunity structure. Three lectures and one lab per week. Prerequisite: Geol 430 or permission of instructor. (4F)

540. Geochemistry. Explores the application of chemistry to the solution of varied geologic problems. Three lectures per week. Prerequisites: Geol 305 or permission of instructor; Geol 410 recommended. (3W)

****544. Exploration Geophysics.** Survey of geophysical techniques used in exploration for hydrocarbons, groundwater, and ore deposits. Emphasis on field surveys, interpretation of data, and exploration applications. Three lectures and one lab per week. Prerequisites: Geol 310, 370; and Phyx 223; or permission of instructor. (4W)

548. Groundwater Geology. Introduction to groundwater hydrology; occurrence, movement, and properties of subsurface water. Four lectures per week. Prerequisites: Geol 111 and Math 221 or permission of instructor; Geol 360 recommended. (4F)

549 (d649). Hydrogeologic Field Methods. Methods of collection and analysis of field data for groundwater studies. Three lectures and one lab per week. Prerequisites: (1) Geol 548; or (2) Geol 111 and CEE 543; or (3) permission of instructor. (4Sp)

***552. Metallic Mineral Deposits.** Origin and geologic occurrence of metallic mineral deposits. Three lectures and one lab per week. Prerequisites: Geol 370, 410, 416. (4Sp)

***554. Petroleum Exploration.** Origin and geologic occurrences of petroleum; seismic stratigraphy, basin analysis, and the search for petroleum; drilling and production; petroleum economics. Three lectures and one lab per week. Prerequisites: Geol 370, 410; or permission of instructor. (4W)

****562 (d662). Glacial Geology.** Introduction to glaciology, glacial erosion and deposition, isostatic and eustatic effects, North American glacial stratigraphy, and glacial geologic research techniques. Three lectures and one lab per week. Prerequisite: Geol 360 or permission of instructor. (4Sp)

****564. Photogeology.** Interpretation of geologic features on aerial photographs. One lecture and two labs per week. Prerequisites: Geol 360 and 370. (3W)

***568 (d668). Quaternary Climate Change.** Analysis of the causes and effects of climate change, methods used to reconstruct past climates, and dating techniques. Two two-hour lectures per week. Prerequisite: Geol 360 or permission of instructor. (4W)

****580. Clay Mineralogy.** Techniques of clay mineral analysis; detailed clay mineral structures; physico-chemical constraints on clay formation and diagenesis; use of clays in paleoenvironmental interpretation. Three lectures and one lab per week. Prerequisite: Geol 305 or permission of instructor. (4Sp)

590. Topics for Teachers. Special topics in geology for elementary and secondary science teachers to provide an understanding of the geology of Utah and the western United States. Emphasis on field and lab activities, and acquisition of geologic materials for classroom use. Prerequisite: Geol 101 or 105 or 111; or permission of instructor. (1-5Su) ®

Graduate[2]

****614. Interpretation of Sedimentary Rocks.** (5Sp)

****616 (d516). Igneous and Metamorphic Petrography.** (4Sp)

****624. Advanced Structural Geology.** (4)

625. Mechanics and Processes in Earth Sciences. (4F)

***631 (d531). Global Geophysics.** (4F)

****632 (d532). Tectonics of Orogenic Belts.** (4F)

***636 (d536). Paleoecology.** (4)

****640. Topics in Hydrogeology (Topic).** (3) ®

649 (d549). Hydrogeologic Field Methods. (4Sp)

****662 (d562). Glacial Geology.** (4W)

***668 (d568). Quaternary Climate Change.** (4W)

680. Seminar. (1-6) ®

697. Thesis. (1-12) ®

699. Continuing Graduate Advisement. (1-3) ®

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[1]Parenthetical numbers preceded by a *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

*Taught 1996-97.

**Taught 1997-98.

Department of

Health, Physical Education and Recreation

College of Education

Head: Professor Robert E. Sorenson
Office in PE 122, 797-1495

Professors Richard D. Gordin, Jr., Lanny J. Nalder; **Associate Professors** Donna L. Gordon, Arthur R. Jones, Dennis A. Nelson, Bradford N. Strand, Rolayne Wilson; **Assistant Professors** Julianne Abendroth-Smith, Hilda Fronske, Steven R. Hawks, John M. Kras, Lynn Walter Topovski; **Lecturers** Raymond Corn, Peter J. Mathesius, Maggi E. Moar, Delphine C. Rossi; **Adviser** Mary Lou Reynolds

Degrees offered: Bachelor of Science (BS) in Health Education Specialist; BS in Physical Education; BS in Parks and Recreation; BS in Dance Education; Master of Science (MS), Master of Education (MEd) in Health, Physical Education and Recreation

Objectives

Activity Courses. USU students are served by an extensive elective activity course program. The number and diversity of courses encourage students to increase their lifetime participation skills, to achieve and maintain a high level of personal fitness, to enjoy opportunities for creativity and expression, and to adopt a preventive medicine life-style conducive to a life of health and well-being.

Recreational and Intramural Activities. The intramural program is planned and conducted to meet the needs of all students regardless of skill or ability. The major objectives are to offer a wide variety of sports experiences, to encourage lifetime sports participation, to develop habits of fair play, and to provide for leadership experiences. The intramural concept not only embraces the traditional highly-organized program with teams, leagues, and tournaments, but also the concept of voluntary free play activities where opportunity is provided for physical recreation activities for all segments of the University community.

Admission Requirements

Departmental Admission Requirements. New freshmen admitted to USU in good standing qualify for admission to any major within the Department of Health, Physical Education and Recreation. However, admission requirements for students transferring from other institutions or transferring from other USU majors differ, depending upon the option chosen. Admission requirements for the various majors and major options are listed below.

Physical Education Major

Admission to the Physical Education major is limited. For application materials, contact the Department of HPER.

Teaching Option. Students transferring from other institutions and students transferring from other USU majors need a 2.75 total GPA to qualify for admission to the Teaching Option.

Pre-Physical Therapy Option. Students transferring from other institutions and students transferring from other USU majors need a 3.0 total GPA to qualify for admission to the Pre-Physical Therapy Option.

Exercise Science Option. Students transferring from other institutions need a 2.75 total GPA, and students transferring from other USU majors need a 2.75 total GPA to qualify for admission to the Exercise Science Option.

Health Education Specialist Major

Community Health Option. Students transferring from other institutions and students transferring from other USU majors need a 2.5 total GPA to qualify for admission to the Community Health Option.

School Health Option. Students transferring from other institutions and students transferring from other USU majors need a 2.75 total GPA to qualify for admission to the School Health Option.

Parks and Recreation Major

Students transferring from other institutions and students transferring from other USU majors need a 2.5 total GPA to qualify for admission to the Parks and Recreation Major.

Secondary Teaching Majors and Minors

An application for admission to teacher education should be completed before the junior year (see College of Education for requirements). Admissions approval is a prerequisite to teacher certification candidacy and to enrollment in education and educational psychology courses.

Course Requirements

Physical Education Major: Teaching Option

The teaching option in physical education offers a program of study leading to a Bachelor of Science degree with K-12

certification. Along with this teaching major, the student must complete a teaching minor and 45 credits of professional education classes. The required courses in the curriculum include PEP 200, 201, 301, 322, 326, 360, 364, 365, 480, 481, 483, 484, 485, 486, 487; HEP 229; one method of coaching class; and 7 credits of skill development. Prerequisite courses include Psy 101; and Phyl 103, 130.

Physical Education Major: Exercise Science Option

The exercise science option in physical education offers a program leading to a Bachelor of Science degree. This option is designed to prepare the physical education major to pursue a vocation in private fitness or corporate fitness, or to pursue the Master of Science degree in Cardiac Fitness and Rehabilitation. The curriculum consists of 60 credits. The required core includes PEP 200, 322, 326, 481, 483, 485, 487; PE 300; HEP 250, 545; and NFS 122. The student must also select at least 27 additional credits from adviser approved electives, including at least 9 credits from the HPER Department, 5 credits of Biology, and 5 credits of Chemistry. Also required are at least three physical skill classes. Prerequisite courses include Phyl 103 and 130.

Physical Education Major: Pre-Physical Therapy Option

The pre-physical therapy option in physical education offers a program leading to a Bachelor of Science degree in physical education. This option is designed to prepare the student to enter a postbaccalaureate degree program in professional physical therapy. The curriculum consists of 81 credits. The required core includes PEP 202, 322, 326, 425, 481, 483, 485, 487; PE 300; HEP 250, 545; and NFS 122. The student must also select 55 elective credits from the following areas: Mathematics, Chemistry, Physics, Biology, and Psychology. All students must complete a six-credit internship in cooperative education as part of the elective requirement.

Physical Education Minor: Physical Education/Coaching Option

The physical education/coaching minor is designed to prepare the student to teach physical education and coach athletics in the secondary school. The required courses in this 32-credit minor include PEP 322, 326, 360, 480, 481, 485, 486, two methods of coaching classes, and a minimum of four credits in skill development. Two of the following courses are required: PEP 364, 365, and 484. Students complete PEP 460 as part of the professional education component. Prerequisite courses include Phyl 103 and 130.

Elementary Education—Physical Education Minor

The elementary education—physical education minor is designed to prepare elementary teachers to teach elementary physical education. The required courses in this 23-credit minor include: PEP 302, 360, 484; HEP 229, 441; and DEP 462. Students must also select 7 or more credits from the following: PE 115, 195, 300; PEP 222, 226, 227, 230; PRP 200; and HEP 250.

Health Education Specialist Major: School Health Option (Teacher Certification)

The school health option offers a program of study leading to a Bachelor of Science degree as a Health Education Specialist. The major requires a total of 95 credit hours. It is also necessary for students to complete an approved teaching minor, ranging from 24 to 28 credit hours. The school health education curriculum consists of the following 45-credit core: Phyl 103, 130; NFS 122; FHD 304; and HEP 229, 250, 401, 441, 451, 456, 457, 458, 459, 461. An additional 3 credits must be selected from the following: HEP 431, 440, 482, 545, 555, 556, 590; PubH 302, 512, 530; Biol 308; SW 365, 375; Soc 333. The final 47 credits are taken from the Professional Education Component for Secondary Education Majors.

Health Education Specialist Major: Community Health Option

The community health option offers a program of study leading to a Bachelor of Science degree as a Health Education Specialist. The major requires a total of 95 credit hours. The community health curriculum consists of the following 60-credit required core: Phyl 103, 130; NFS 122; FHD 304; MHR 311; Psy 380; InsT 516; PubH 512, 530; HEP 229, 250, 401, 426, 441, 451, 457, 461, 482, 545. Students must select 35 credits of elective courses, taking at least one course from each of the following three areas: *Human Nature:* Anth 409; Psy 110, 121; FHD 150, 381; Soc 238, 333; SW 250, 365; *Content and Methods in Education:* BIS 140, 155; Comm 130, 232, 317; FHD 440; HEP 431, 440, 456, 458, 459, 555, 556, 590; PEP 481, 501; Psy 372, 515, 520; Soc 446, 475; Spch 105; *Organizational Dynamics in the Family and Community:* Comm 452; FHD 301; PolS 205; PubH 302, 349; Soc 452, 472; Spch 260, 325.

School Health Minor (Teacher Certification)

The school health minor requires a total of 30 credit hours: Phyl 103; FHD 304; HEP 229, 250, 401, 441, 451, 456, 458, 461. HEP 459 must also be taken as part of the Secondary Education Professional Component.

Community Health Minor

For a community health minor, students must complete the following courses, totaling 30 credits: Phyl 103; NFS 122; FHD 304; HEP 229, 250, 401, 426, 441, 451, 461.

Dance Education

All majors and minors must be enrolled in the appropriate Technique class every quarter.

Teaching Major in Dance

A minimum of 62 credits is required for a teaching major in dance. All dance majors must complete six consecutive quarters with the department's performing company, *Danceworks*. Students must also reach the advanced technique level for a minimum of six quarters. To enter the program and enroll in 300- and 400-level courses, students must have a GPA of 2.75.

For detailed listings of required and elective courses, refer to the Dance Program major requirement sheet. Students should see their assigned advisers as soon as possible after entering the program to receive assistance in selecting the best option to meet their goals.

Teaching Minor in Dance

A minimum of 30 credits is required for a teaching minor in dance. Students are required to reach the advanced technique level for a minimum of three quarters.

Dance Education students should be aware that they must maintain a 2.5 GPA, and should fill out an application for admission to teacher education during their sophomore year. Approval is a prerequisite to certification candidacy and to enrollment in education and psychology classes.

Dance Performance Major

Majors in dance performance complete a program of study of a minimum of 77 credits. Graduates from this major option will be able to select from a variety of career options. Those wishing to begin a business of their own are strongly encouraged to obtain a business minor. A dance major must complete nine consecutive quarters with the department's performing company, *Danceworks*. Students must also reach the advanced technique level for a minimum of nine quarters.

For detailed listings of required and elective courses, refer to the Dance Program major requirement sheet. Students should see their assigned advisers as soon as possible after entering the program to receive assistance in selecting the best option to meet their goals.

Dance Performance Minor

Students must complete a minimum of 31 credits for the dance performance minor. Students are required to reach the advanced technique level for a minimum of six quarters. Dance minors must complete six quarters with the performing dance company, *Danceworks*.

Parks and Recreation Major

The HPER Department offers a program of study leading to a Bachelor of Science degree in Parks and Recreation. This program prepares students to become professionals in the public, private, commercial, and voluntary settings of parks and recreation who are capable of leading, programming, planning, designing, and administering these programs. The Bachelor of Science degree requires 65 credits. The following courses are required: PRP 100, 200, 225, 403, 404, 405, 406, 409 or 500, 410, 450, 480, 501, 505, 551, 552, 555; RR 250 or 300. In addition the student must choose 7 credits from the following courses: LAEP 103; RR 451, 510, 520; PE 101, 120, 136, 155, 160; HEP 229; PRP 425, 525. Students must also complete an outside minor, which must be approved by the HPER Department.

Parks and Recreation Minor

A minor in Parks and Recreation consists of a minimum of 24 credits of coursework selected from the core courses. The required courses in this 24-credit minor include PRP 100, 200, 403, 404, 406, 552. Students must also select 6 additional credits from the following courses: PRP 409, 450, 500, 505; RR 250, 300.

Graduate Study

The department offers courses leading to the Master of Science and Master of Education degrees in health, physical education, and recreation.

Health, Physical Education and Recreation Courses

Professional Courses in Health Education

225. Introductory Cooperative Work Experience. An introductory level educational work experience in a cooperative education position approved by the department. (1-6F,W,Sp,Su) ®

229. First Aid and Emergency Care. American Red Cross course providing information necessary for development of first aid knowledge, ability, and personal judgment. Functional capabilities developed to provide initial care necessary to maintain life support. (2F,W,Sp)

IO 250. Health and Wellness. Designed to assist students in planning a life-style conducive to activating and improving one's optimal health and wellness, human ecology, and health investiture. (2F,W,Sp,Su)

350. Elementary School Health Education. Explores child health status and the vital roles that the school/elementary teacher plays in enabling children to acquire healthful lifestyle behaviors. (3Sp)

401. Principles of Community Health Education. Emphasis on professional preparation for work with community agencies, facilities, and programs with focus on educating the public on health issues. Prerequisite: HEP 250 or consent of instructor. (3F)

425. Advanced Cooperative Work Experience. Cooperative education work experience position; increased level of complexity and a more professional level of experience as student advances toward completion of the program. (1-15F,W,Sp,Su) ®

426. Professional Development in Community Health Education. Professional preparation course for community health majors and minors. Special emphasis on ethics in health education, behavioral and sociological theories used in the profession of health education, learning and motivation theory, philosophical issues, and health education methodologies. (3W)

430. Cardiopulmonary Resuscitation. Techniques and skills of airway management and cardiopulmonary resuscitation for the layperson, taught according to 1992 revised standards. No prerequisites necessary. Offered off-campus only, through the Extension Class Division. (1F,W,Sp,Su)

431. First Aid Instructors Course. Methods of teaching first aid, evaluation of teaching methods, and experience in administering tests. American Red Cross Certification available to those who meet the requirements. Prerequisite: HEP 229. (3Sp)

440. Stress Management. Deals with concepts and principles which help individuals to maximize positive stress outcomes and minimize negative stress effects in obtaining and maintaining a normal, healthy homeostatic condition. (3Sp)

441. Alcohol, Tobacco, and Drugs. Students evaluate the use, misuse, and abuse of drugs in relation to the physical, mental, social, emotional, and value dimensions of individuals and society. (3F,W,Su)

451. Planning and Evaluation in Community Health Education. Essentials of systems and procedures for appropriate planning and evaluation of programs in health education and promotion. Prerequisite: HEP 401 or consent of instructor. (3Sp)

456. Health Foundations of Education. Responsibilities of public school teachers relating to health services, health environment, and health instruction. Implications of state school health laws are discussed. (3W)

457. Consumer Health. Focuses on helping students to become discriminating consumers of health information, health products, and health services. (3F)

458. Sex Education in School Health Curriculum. Discusses how to teach human sexuality in secondary schools, highlighting issues such as growth and maturation, fetal development, birth, family planning, and social values. (3F)

459. Methods and Materials in Health Education. Based on principles of learning and teaching strategies; students plan, present, and evaluate health lessons. A teaching resource file is developed. (4F,W,Sp)

461. Race, Class, and Gender Issues in Health Education. Introductory course for health education students concerning how multicultural issues affect health status and health choices. Special emphasis on health impacts of race, ethnicity, socioeconomic status, and gender. Exploration of strategies for making health education culturally relevant. (3F,Sp)

482. Field Work in Health Education. Supervised student participation in school or community health programs or directed projects. Prerequisites: HEP 401 and 451. (1-5F,W,Sp,Su)

497H. Senior Thesis. Culminating experience within the department for Honors students. Student works closely with a faculty mentor in an extensive project in the student's area of expertise and interest. (1-9F,W,Sp,Su)

510 (d610).[1] Current Trends in Health Education. Focuses on trends and issues in health; analyzes directions in which health education can go to confront the issues and formulate solutions. (3Sp)

545 (d645). Health Aspects of Aging. Major physical health aspects of aging and the aged including life expectancies, diseases, diet and exercise, medical care, death, loneliness, and communication with the aged. Prerequisite: junior standing. (3W)

555. Practicum in Evaluating School System Programs. An in-service seminar for experienced teachers. Emphasizes a look at strengths and weaknesses of existing programs, proposed programs, and ways to assess specific school or district programs. (1-6F,W,Sp,Su) ®

556. Practicum in Improving School System Programs. An in-service seminar for experienced teachers which emphasizes improvement of instruction. (1-6F,W,Sp,Su) ®

590. Independent Study. (1-3F,W,Sp,Su) ®

591. Independent Research. (1-3F,W,Sp,Su) ®

Graduate[2]

610 (d510). Current Trends in Health Education. (3Sp)

625. Graduate Cooperative Work Experience. (1-15) ®

640. Stress Management. (3W)

645 (d545). Health Aspects of Aging. (3W)

655. Practicum in the Evaluation of Instruction. (1-6) ®

656. Practicum in the Improvement of Instruction. (1-6) ®

682. Seminar in Health Education. (1-5W) ®

690. Independent Study. (1-3) ®

691. Independent Research. (1-3) ®

697. Thesis. (1-9) ®

699. Continuing Graduate Advisement. (1-12) ®

[1]Parenthetical numbers preceded by a *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

Professional Courses in Physical Education

200. Introduction to Physical Education. Designed to introduce major students to the profession of physical education—its nature, background, and role in today's schools and society. (2F,Sp,Su)

201. Introduction to Teaching Physical Education. Designed to provide students opportunities to practice and develop teaching methods. Provides orientation to, and preparation for, student teaching. Prerequisite: PEP 200. (2F,Sp)

202. Introduction to Physical Therapy. Introduces prephysical therapy students to the discipline of physical therapy and familiarizes them with its associated spectrum of opportunities and responsibilities. Prerequisite: PEP 200. (2F)

204, 205. Sports Officiating. Knowledge of the rules and mechanics of officiating football, basketball, volleyball, and softball. Attention is given to instruction of other game officials. PEP 204 deals with football. PEP 205 deals with basketball, volleyball, and softball. (2F) (2W)

206. Administration of Intramural Sports. Prepares students to organize and administer a program of intramural sports and club sports at the public school or college level. (3W)

222. Fundamentals of Badminton and Basketball. Provides physical education majors and minors with knowledge, skills, and understanding of basketball and badminton for successful participation in basketball and badminton, as well as teaching competency. (1W,Sp)

223. Fundamentals of Softball and Football. Provides physical education majors and minors with knowledge, skills, and understanding of softball and football to allow successful participation as well as teaching competency. (1F,Sp)

225. Introductory Cooperative Work Experience. An introductory-level educational work experience in a cooperative position approved by the department. Credit arranged. (1-6F,W,Sp,Su) ®

226. Fundamentals of Volleyball and Tennis. Provides physical education majors and minors with knowledge, skills, and understanding of tennis and volleyball for successful participation in tennis and volleyball, as well as teaching competency. (1F,Sp)

227. Fundamentals of Swimming. Provides physical education majors and minors with knowledge, skills, and understanding of swimming for successful participation in swimming as well as teaching competency. (1F,W,Sp)

229. Fundamentals of Dance. Prepares physical education majors in the fundamentals of dance. Includes line dance, ballroom dance, folk dance, aerobic/step, and square dance. Helps prospective teachers develop skill, knowledge, and teaching competencies in these five dance forms. (1F,W)

230. Fundamentals of Track and Field and Soccer. Provides physical education majors and minors with knowledge, skills, and understanding of track and field and soccer for successful participation in track and field and soccer as well as teaching competency. (1F,Sp)

301. Physical Education in the Elementary School. Designed for elementary education majors. Stresses development of a positive body image, basic movement, exploration, locomotor and manipulative skills, planning, organizing, and teaching. (3F,W,Sp,Su)

302. Practicum in Elementary School Physical Education. Focuses on selection of activities and the construction and use of inexpensive and innovative equipment. Students plan and teach approved activities in elementary schools. (3W) ®

322. Prevention and Care of Athletic Injuries. Introduction to athletic training. Emphasis on prevention of injuries to athletes. Students will become familiar with common medical and human anatomical terminology. (2F,Sp)

326. Anatomical Kinesiology. An understanding of human anatomy and basic mechanical principles which is fundamental to the application of efficient human movement. Prerequisite: Phyl 103. (3F,W,Sp)

360. Motor Learning. Exploration and explanation of materials, methods, and mechanisms that underlie the learning and performance of motor skills. (3W,Sp,Su)

364. Strategies and Materials for Teaching Individual and Dual Sports. Deals with strategies, techniques, and materials involved in planning and implementing quality physical education programs in dual and individual sports. Lesson, unit planning, and evaluation are discussed. (2F,Sp)

365. Strategies and Materials for Teaching Team Sports. Deals with strategies, techniques, and materials involved in planning and implementing quality physical education programs in team sports. Lesson, unit planning, and evaluation are discussed. (2F,W)

***407. Gender and Sport.** To survey the multidisciplinary analysis of the problems, patterns, and processes associated with the involvement of women in sports programs. (3 Alt Sp)

422. Advanced Prevention and Care of Athletic Injuries. Exposes students to advanced concepts and practical laboratory experiences in the prevention and care of athletic injuries. Students will be exposed to all concepts necessary to plan, coordinate, and supervise all components of an athletic training room. Approval of instructor required. (3F,Sp)

425. Advanced Cooperative Work Experience. Cooperative education work experience position; increased level of complexity and a more professional level of experience as student advances toward completion of the program. (1-15F,W,Sp,Su) ®

460. Methods in Physical Education. Planning, strategies, techniques, and methods of teaching in physical education. Students participate in discussion and practical experience. Laboratory work experience required. Prerequisites: PEP 364, 365. (4F,Sp)

470. Football Coaching Methods. Outlines the methods, strategies, and techniques of coaching scholastic football. (2Sp)

471. Basketball Coaching Methods. Outlines the methods, strategies, and techniques of coaching scholastic basketball. (2F)

472. Track and Field Coaching Methods. Outlines the methods, strategies, and techniques of coaching scholastic track and field. (2Sp)

473. Methods of Coaching Soccer. Outlines the methods, strategies, and techniques of coaching scholastic soccer. (2Sp)

474. Methods of Coaching Volleyball. Comprehensive plan for coaching/teaching on a highly skilled level. Provides background in the methods necessary to better understand and coach volleyball. (2W)

480. Mental Aspects of Sports Performance. This course attempts to provide a current knowledge of sport psychology and the applications this knowledge has for teaching sports and coaching in public schools. (3F,W)

481. Physiology of Exercise. A study of physiological changes that occur as a result of exercise and work. The course involves laboratory practicum as a means of demonstrating physiological change. Prerequisite: Phyl 130. (3W,Sp,Su)

483. Biomechanics. Focuses on improved teaching and coaching through biomechanical and anatomical analysis of sports and related activities. Prerequisite: PEP 326. (3W,Sp)

484. Strategies and Materials for Teaching Fitness. Deals with strategies, techniques, and materials involved in planning and implementing quality physical education programs with fitness activities. Lessons, unit planning, and evaluation are discussed. (2F,Sp)

485. Principles of Conditioning. Prospective teachers will develop methods and teaching skills for conditioning the human body using various fitness components in sports, exercise, and conditioning classes. Prerequisite: PE 300. (3W,Sp,Su)

486. Administration of Physical Education. Focuses on administrative procedures in secondary education; includes curriculum development and program planning. (3W,Sp)

487. Evaluation in Physical Education. Focuses on the nature and use of a variety of tests in physical education. Practical application, interpretation, and use of test results are stressed. (3F,Sp)

497H. Senior Thesis. Culminating experience within the department for Honors students. Student works closely with a faculty mentor in an extensive project in the student's area of expertise and interest. (1-9F,W,Sp,Su)

500 (d600).[1] Administration of Athletics. Prepares students to organize and administer interscholastic and intercollegiate sports at the public school or university level. Consideration is given to both the challenges and standards associated with such programs. (3Sp)

501 (d601). Leadership in Health, Physical Education and Recreation. A group approach to improvement and innovation in leadership and supervisory skills. Familiarization with administrative skills and duties through discussion and lab approach. (3W)

505 (d605). Psychological Aspects of Sports Performance. Psychological theory and principles applied to sports. Includes motivational techniques, psychological evaluation, stress and anxiety in sports, personality and sports performance. (3Sp,Su)

507 (d607). Sport in Society. Introduces students to complex role and social significance of sport in contemporary society; students become familiar with aims, scope, and potential contributions of sport in society. (3F)

543 (d643). History and Philosophy of Physical Education and Sport. History of physical education; philosophical influences which have contributed to contemporary physical education; methods of educational instruction using the primary philosophical positions. (3W,Su)

555. Practicum in Evaluating School System Programs. An in-service seminar for experienced teachers. Emphasizes a look at strengths and weaknesses of existing programs, proposed programs, and ways to assess specific school or district programs. (1-6F,W,Sp,Su) ®

556. Practicum in Improving School System Programs. An in-service seminar for experienced teachers which emphasizes improvement of instruction. (1-6F,W,Sp,Su) ®

590. Independent Study. (1-3F,W,Sp,Su) ®

591. Independent Research. (1-3F,W,Sp,Su) ®

Graduate[2]

600 (d500). Administration of Athletics. (3Sp)

601 (d501). Leadership in Health, Physical Education and Recreation. (3Sp)

602. Seminar in Risk Reduction. (1W)

***605 (d505). Psychological Aspects of Sports Performance.** (3Sp, Alt Su)

607 (d507). Sport in Society. (3F)

625. Graduate Cooperative Work Experience. (1-15F,W,Sp,Su) ®

****630. Advanced Biomechanics.** (3F, Alt Su)

****640. Advanced Exercise Physiology and Laboratory Practicum.** (5F, Alt Su)

***642. Curriculum in Physical Education.** (3W, Alt Su)

643 (d543). History and Philosophy of Physical Education and Sport. (3W,Su)

645. Electrocardiography and Exercise Testing Protocols. (5W)

648. Marketing Wellness Programs in Corporations. (3W)

650. Interdisciplinary Workshop. (1-3)

654. Exercise Prescription Writing. (3Sp)

655. Practicum in the Evaluation of Instruction. (1-6F,W,Sp,Su) ®

656. Practicum in the Improvement of Instruction. (1-6F,W,Sp,Su) ®

657. Practicum in Cardiac Rehabilitation and Adult Fitness. (1-10F,W,Sp,Su)

669. Analysis of Teaching Physical Education. (3Sp)

681. Research Seminar. (3F,Su) ®

***683. Motor Learning.** (3W, Alt Su)

685. Principles and Techniques of Conditioning and Rehabilitation. (3Sp)

690. Independent Study. (1-3F,W,Sp,Su) ®

691. Independent Research. (1-3F,W,Sp,Su) ®

696. Master's Project. (3F,W,Sp,Su)

697. Thesis. (1-9F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

755. Practicum in the Evaluation of Instruction. (1-6F,W,Sp,Su)

756. Practicum in the Improvement of Instruction. (1-6F,W,Sp,Su)

790. Independent Study. (1-3F,W,Sp,Su) ®

791. Independent Research. (1-3F,W,Sp,Su) ®

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*Taught 1996-97.

**Taught 1997-98.

[1]Parenthetical numbers preceded by a *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Professional Courses in Parks and Recreation

100. Recreation and Leisure in Modern Society. Introduces the role of leisure and recreation in society, history, trends, issues, and socioeconomic values. Evaluates the role and responsibility of public and private agencies. (3F,Sp)

200. Social Recreation. Demonstrations and practical experience in the nature of social recreation; use of recreation with various age groups; planning, design, and evaluation of social recreation. (3F,Sp)

225. Introductory Cooperative Work Experience. An introductory-level educational work experience in a cooperative education position approved by the department. (1-6F,W,Sp,Su) ®

403. Recreation Programming. Principles of programming, their models and methods; classification and analyses of activities; structural organization of recreation programs; program evaluation. (3W)

404. Community Recreation. Preparation in community organization of recreation; role of agency operation centering on budgetary procedures and grantsmanship; role of interagency relationships. (3Sp)

405. Commercial Recreation. History, organization, and management of commercial recreation. Instruction in entrepreneurship, design, marketing, and management of commercial project. (3W)

406. Outdoor Recreation. Overview, scope, and extent of outdoor recreation planning; the agencies that provide services; the methodology of planning and evaluating programs and resources. (3F)

409. Camp Management and Counseling. Preparation in the camp management and administrative process; camp counseling process; techniques of camp activity skills. (3Sp)

410. Internship in Recreation. Designed to give students practical experience working full-time for a recreation organization for one quarter. Prerequisites: PRP 100, 200, 225, 403, and 404. (12F,W,Sp,Su) ®

425. Advanced Cooperative Work Experience. Cooperative education work experience position; increased level of complexity and a more professional level of experience as student advances toward completion of the program. Prerequisite: PRP 225 or 410. (1-15F,W,Sp,Su) ®

450 (d600).[1] Recreation for Diverse Populations. Examination of leadership and programming techniques and strategies used to meet the recreational needs of individuals in all populations, including those with disabling conditions. (3F)

480 (d680). Seminar in Recreation. Student presentation of thesis and project studies. Informal discussions, critical analysis of problems, informal lectures by invited speakers and class members. (1F) ®

497H. Senior Thesis. Culminating experience within the department for Honors students. Student works closely with a faculty mentor in an extensive project in the student's area of expertise and interest. (1-9F,W,Sp,Su)

500. Aquatic Recreation Resource Management. Study of the principles, practices, and guidelines for management of effective public and private aquatic resources. Focus on planning, development, and facility design. (3Sp)

501 (d601). Leadership in Health, Physical Education and Recreation. A group approach to improvement and innovation in leadership and supervisory skills. Familiarization with administrative skills and duties through discussion and lab approach. (3W)

505 (d605). Therapeutic Recreation. An analysis of various special population groups served by recreation; the clinical application of recreation programs and activities; special institution's procedures, terminology, and operation. Prerequisite: PRP 450. (3F)

525 (d650). Advanced Therapeutic Recreation. Highlights the advanced protocol procedures of disability identification, program development, treatment planning, progress note writing, and protocol evaluation. Prerequisite: PRP 505. (3W)

551. Philosophy of Recreation. Insight into the problems and issues Americans face as the result of increased leisure. Exploration of possible solutions to these problems through the medium of recreation. Prerequisite: PRP 410 or adviser's approval. (3W)

552 (d652). Recreation Administration. Problems of organization and administration of parks and recreation departments, including personnel management considerations. (3W)

555. Recreation Park and Facility Management. Study of recreation park and facility management, including an examination of supply, demand, population, maintenance, and safety analysis in developing appropriate areas and facilities for parks. Prerequisite: PRP 100. (3Sp)

590. Independent Study. (1-3) ®

591. Independent Research. (1-3F,W,Sp,Su) ®

Graduate[2]

600 (d450). Recreation for Diverse Populations. (3F)

601 (d501). Leadership in Health, Physical Education and Recreation. (3W)

605 (d505). Therapeutic Recreation. (3F)

625. Graduate Cooperative Work Experience. (1-15F,W,Sp,Su) ®

650 (d525). Advanced Therapeutic Recreation. (3W)

652 (d552). Recreation Administration. (3Sp)

680 (d480). Seminar in Recreation. (1F) ®

690. Independent Study. (1-3F,W,Sp,Su) ®

691. Independent Research. (1-3F,W,Sp,Su) ®

697. Thesis. (1-9) ®

699. Continuing Graduate Advisement. (1-12) ®

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Activity Courses in Physical Education

101. Skiing. (1)

104. Track and Field. Varsity. (1Sp) ®

106. Indoor Track and Field. Varsity. (1Sp) ®

107. Cross Country. Varsity. (1F) ®

108. Jogging. (1F,W,Sp,Su) ®

111. Weight Training. (1F,W,Sp) ®

112. Advanced Physical Conditioning. Designed for members and prospective members of competitive teams and for the student desiring a personalized program. Varsity. (1F,Sp) ®

113. Body Conditioning. (1F,W,Sp,Su) ®

115. Gymnastics. Designed for beginning and novice gymnists. Focuses on tumbling fundamentals and introduction to the Olympic events. (1F,W,Sp) ®

120. Golf. (1F,Sp,Su) ®

124. Pre Ski Conditioning. (1F) ®

127. Hiking. (1Sp) ®

128. Cycling. Conditioning class with emphasis on training for both touring and racing. Introduction to road safety principles, various riding techniques, and cycle maintenance. (1F,Sp,Su) ®

132. Self Defense. (1F,W,Sp) ®

134. Badminton. (1F,W,Sp) ®

136. Tennis. (1F,Sp,Su) ®

141. Flag Football. Physical activity class in which students can participate in flag football at a recreational level. (1F)

142. Varsity Football. (1F) ®

143. Softball. (1Sp) ®

146. Basketball. (1F,W,Sp) ®

148. Volleyball. (1F,W,Sp,Su) ®

150. Ultimate Frisbee. A physical activity that provides fitness and recreational opportunities for students. (1F,Sp)

152. Soccer. (1F) ®

155. Racquetball. (1F,W,Sp,Su) ®

160. Swimming. (1F,W,Sp,Su) ®

195. Aerobic Dance. (1F,W,Sp,Su) ®

300. Dynamic Fitness. Designed to develop positive health practices in the areas of physical activity, diet, rest, and relaxation of living through classroom, laboratory, and activity experiences. (3F,W,Sp,Su) ® ©

462. Water Safety Instructor. Attention is given to methods of teaching swimming, lifesaving. American Red Cross certification is given students who pass the exam. Prerequisite: American Red Cross Advanced Lifesaving certificate. (3W,Sp) ®

463. Lifeguard Training. Designed to prepare students as pool or nonsurf open water lifeguards. Presents knowledge and skills necessary for lifeguard functions. American Red Cross certification available. (3F,W,Sp)

Activity Courses in Recreation Education

103. Billiards. (1F,W,Sp,Su) ®

115. Map Reading/Orienteering. Orienteering is a timed cross country race. Includes use of topographic maps and compass. Opportunity is provided for participation in at least one local meet. (2) ®

120. Cross Country Skiing. Focuses on knowledge, techniques, equipment, and safety necessary to participate in and enjoy winter recreational activities: cross country ski touring and snowshoeing. (1W) ®

Professional Courses in Dance Education

225. Introductory Cooperative Work Experience. An introductory-level educational work experience in a cooperative education position approved by the department. (1-6F,W,Sp,Su) ®

227. Fundamentals of International Folk Dance. A course designed to develop teaching techniques in folk dance. (1F)

250. Forum Studio Performance—Performers. Practicum course in modern dance designed to provide students with experience in performing and producing a studio performance. (1-2Sp) ®

***290. Fundamentals of Modern Dance.** Theory of modern dance as a preparation for teaching and choreography. A lecture/lab class for dance majors and minors. Prerequisite: 3 credits of modern dance at level I or above. (2F)

291. Modern Dance I. Concentrates on beginning-level skills in modern dance technique. For majors or nonmajors. Audition required. (1F,W,Sp) ®

292. Modern Dance II. Concentrates on modern dance technique for the intermediate-level student. For majors or nonmajors. Audition required. (2F,W,Sp) ®

309. Improvisation. Designed to provide a foundation in the area of improvisation, as a preparation for composition and choreography as well as for teachers of modern dance. Prerequisite: DEP 292. (2F)

311. Dance Composition. Focus will be on movement "studies" to practice the skills used in creating, abstracting, and manipulating movement. Prerequisites: DEP 309, 393, and permission of instructor. (3F)

312. Choreography. Continuation of work done in DEP 311, focusing on the development of material, theme, and performance style. Prerequisite: DEP 311. (3W)

****313. Dance Production.** This course prepares dance majors for all aspects of dance concert production through lecture, research, and assigned projects. (3W)

***314. Dance History.** Survey of dance history beginning with primitive dance and advancing through current dance forms. (4W)

315. Rhythmic Analysis and Accompaniment. Students will study rhythmic structure, identify various rhythms, explore methods of accompaniment, and become proficient at playing specific rhythms for dance class. DEP 315 is a prerequisite for DEP 311, 312, and 467. (3Sp)

350. Forum Studio Performance—Choreographers. Practicum course in modern dance designed to provide students with experience in choreography and producing a studio performance. (2-4Sp) ®

393. Modern Dance III. Modern dance technique for the advanced student. For majors or nonmajors. Audition required. (3F,W,Sp) ®

425. Advanced Cooperative Work Experience. Cooperative education work experience position; increased level of complexity and a more professional level of experience as student advances toward completion of the program. (1-15F,W,Sp,Su) ®

462. Methods of Movement Exploration for Elementary Teachers. Designed for elementary teachers. Movement experiences will range from classroom situation and curriculum development to large open space activities and performance. (3F,Su)

467. Methods of Teaching Modern Dance. Designed to prepare dance majors/minors to teach modern dance in the secondary schools. The students will be given an opportunity to build teaching skills using a variety of approaches. Prerequisites: DEP 290, 291, 292, 309, 311, 312, 315. (3Sp)

490. Practicum—Danceworks. Designed to provide students with experience in choreographing, performing, and producing dance concerts, lecture-demonstrations, and master classes. Audition required. (1-3F,W,Sp) ®

497H. Senior Thesis. Culminating experience within the department for Honors students. Student works closely with a faculty mentor in an extensive project in the student's area of expertise and interest. (1-9F,W,Sp,Su)

555. Practicum in Evaluating School System Programs. An in-service seminar for experienced teachers. Emphasizes a look at strengths and weaknesses of existing programs, proposed programs, and ways to assess specific school or district programs. (1-6F,W,Sp,Su) ®

556. Practicum in Improving School System Programs. An in-service seminar for experienced teachers which emphasizes improvement of instruction. (1-6F,W,Sp,Su) ®

590. Independent Study. (1-3F,W,Sp,Su) ®

Activity Courses in Dance Education

170. Introduction to Modern Dance. This course is designed to introduce the art of modern dance to the nondance major. Students are given the opportunity to begin working with the technical and creative aspects of dance with the intention of broadening their movement skills and their understanding of the form. (1F,W,Sp) ®

174. Elementary Precision Rhythms. Aggiettes. (1) ®

181. Beginning Ballet. A discipline in recognized classic form. Includes barre exercises, port de bras, and center practice in balance, jumping, and turns. (1F,W,Sp) ®

190. Tap Dance. Designed to prepare the dance major in fundamental and technical skills of tap dancing. Provides knowledge and experience in choreography and preparation of dance performances. (1Sp)

191. Modern Jazz Dance. Provides training and experience in the styles of jazz, one of the most popular forms of American dance. Prerequisite: one year of modern dance or ballet. (1F,W)

282. Intermediate Ballet. A continuation of 181 with more emphasis on exactness and precision of line. Prerequisite: three years of ballet or permission of instructor. (1F,W,Sp)

Dance West Summer Classes

DE 170W. Jazz. Provides training and experience in the styles of jazz, one of the popular forms of American dance. (1Su)

DE 180W. Dance West Performance. Students will learn dances to be performed in "The West: America's Odyssey." Prerequisite: audition. (1-3Su)

DE 184W. Beginning Classical Ballet. A discipline in recognized classic form. Includes barre exercises, port de bras, and center practice in balance, jumping, and turns. (2Su)

DE 187W. Beginning Classical Modern Dance. Designed to develop coordination, ease, and poise in handling the body. Focuses on dance as an art using the body as a medium of expression. (2Su)

DE 190W. Tap Dance. Provides a fundamental knowledge in the technical skills of tap dancing. (1Su)

DE 285W. Intermediate Classical Ballet. Barre exercises, port de bras, and center practice in balance, jumps, beats, and turns with more emphasis on exactness and precision of line. Prerequisite: one year of ballet or permission of instructor. (2Su) ®

DE 288W. Intermediate Classical Modern Dance. Stresses alignment of the skeletal structure, freedom and movement of the torso, and technical work enabling the dancer to secure the natural axis of balance. Prerequisite: one year modern dance or permission of instructor. (2Su)

DE 386W. Advanced Classical Ballet. Pointe and pas de deux. Intensified center floor work concentrating on longer adagio and allegro combinations. Prerequisite: five years of ballet or permission of instructor. (3Su) ®

DE 389W. Advanced Classical Modern Dance. Designed to explore the sociological impact of the various cultures upon movement. Prerequisite: three years modern dance or permission of instructor. (3Su)

DEP 450W. American Character Ballet. Focuses on Burch Mann's influence upon dance character and heritage. The birth of human spirit in the American heritage of the dance. (3Su)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

*Taught 1996-97.

**Taught 1997-98.

Department of
History

College of Humanities, Arts and Social Sciences

Head: Professor Norman L. Jones
Office in Main 323, 797-1290, TTD 797-1297

Professors Jay Anderson, Anne M. Butler, Stanford Cazier, C. Robert Cole, R. Edward Glatfelter, Clyde A. Milner, II, Carol A. O'Connor, F. Ross Peterson, Barre Toelken; **Professors Emeritus** S. George Ellsworth, William F. Lye, Charles S. Peterson; **Associate Professors** Mark L. Damen, David R. Lewis, Daniel J. McInerney, Michael L. Nicholls, Leonard N. Rosenband, Steve Siporin, Frances B. Titchener; **Assistant Professors** Christopher A. Conte, Peter Mentzel

Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA), Master of Science (MS), and Master of Arts (MA) in History; participates in Master of Social Sciences (MSS)

Objectives

The Department of History offers courses leading to careers in teaching, research, and public service. In addition, the department provides a wide variety of courses supporting other fields of specialization, and in general education.

Requirements

Departmental Requirements. Admission requirements for the Department of History include a 2.5 GPA in history courses and a 2.5 overall GPA. Students in good standing may apply for admission to the department.

A grade of *C* or better is required in any history course used to meet the requirements for a major, minor, teaching major, or teaching minor in history. A 2.5 grade point average in the major is required for graduation.

General Education Requirements. History majors are required to complete the Area Studies Certificate in the Liberal Arts and Sciences Program (LASP) to fulfill the Broadening Knowledge section of the University General Education requirement. (Students should see their adviser or an adviser in the Science/HASS Advising Center in Student Center 304.) Although encouraged to complete the Area Studies Certificate, transfer students with 45 or more credits may choose to fulfill the University General Education Broadening Knowledge requirement.

Major in History. Fifty-three credits of history coursework are required. The student should complete as soon as possible survey courses in American Civilization (Hist 170), and either Comparative World Civilizations (Hist 101, 102, 103), or Western Civilization (Hist 104, 105). After completing the civilization surveys, majors should take Sources and Literature of History (Hist 300) in preparation for upper-division work. The student should then take such upper-division courses as will satisfy his or her particular interest. All seniors should take History 499, a senior proseminar. English 101 and 201 are the departmental communications requirements.

Those who plan to do graduate work in history should complete at least two years of a foreign language as an undergraduate. During the senior year they are also urged to take the Graduate Record Examinations.

The study of history requires an understanding of many fields of human endeavor. The student majoring in history must select a minor and should take electives in fields closely related to history, such as literature, economics, geography, anthropology, political science, and sociology. Especially recommended are courses in the history of art, literature, music, drama, political thought, economics, social thought, and philosophy.

Teaching Major in History. History constitutes the major subject matter in the social studies curriculum of the junior and senior high schools. Those who plan to teach in secondary schools should also consult with the College of Education and obtain a secondary school teaching certificate. Coursework for a teaching major in history should include the basic survey courses in American History (Hist 170), the Comparative Civilizations group (Hist 101, 102, 103), or the Western Civilization group (Hist 104, 105), and Hist 300. The Proseminar (Hist 499) is required. Students should organize their remaining coursework to include at least 6 credits of upper-division American history, at least 6 credits of upper-division European history, and some credits of upper-division history in other world areas.

A teaching major in history should include a broad foundation in the social sciences, and therefore the minor should be in one of the social sciences. Economics, political science, geography, and sociology are recommended. Upper-division courses in history and work in the minor and allied fields should be selected in consultation with one's adviser.

Minor in History. A minimum of 30 credits is required for a minor in history. Hist 101, 102, and 103, or Hist 104, 105, and 170 are recommended.

Teaching Minor in History. A total of 30 credits constitutes a teaching minor. Hist 101, 102, and 103, or Hist 104, 105, and 170 are required. In addition, the student should complete 14 or 15 credits of upper-division work.

Classics Minor with Emphasis in Civilization. A minimum of 31 credits is required for a Classics minor with civilization emphasis, including Hist 104, 304, 306, and 16 approved elective credits.

Classics Minor with Emphasis in Latin Language. A minimum of 18 credits is required for a Classics minor with Latin emphasis, including 10 credits of upper-division Latin, Hist 306, and 3 approved elective credits.

Classics Minor with Emphasis in Greek Language. A minimum of 18 credits is required for a Classics minor with Greek emphasis, including 10 credits of upper-division Greek, Hist 304, and 3 approved elective credits.

An application for admission to teacher education should ordinarily be completed during the sophomore year (see College of Education for requirements). Approval is a prerequisite to certification candidacy and to enrollment in education and psychology courses.

Graduate Study

The Department of History offers programs leading to the Master of Arts, the Master of Science, and the Master of Social Sciences. For details see the *Graduate Catalog*.

History Courses

Lower Division

101. Comparative Civilizations: Ancient and Medieval. Survey of the major civilizations of the world; concerned with political, social, economic, artistic, and intellectual attainments of humankind. Earliest times to about A.D. 1300. (3) ©

102. Comparative Civilizations: Early Modern. A comparative survey of major world civilizations during the period of transformation to European domination. From about 1300 to 1850. (3) ©

103. Comparative Civilizations: Modern. A comparative survey of major world civilizations in the modern period. Special attention given to political, social, intellectual, and technological transformations of the past one and one-half centuries. (3) ©

SS 104. Western Civilizations: Ancient and Medieval. A survey of European civilization from its origins to about A.D. 1500. Emphasis on cultural, political, religious, social, economic, intellectual, and artistic achievements. (5F,W,Sp)

SS 105. Western Civilization: Modern. A survey of European civilization from the Reformation to the present day. (5F,W,Sp)

HU 124. Introduction to Folklore. Major types of folklore (e.g., legend, folktale, ballad, folksong, custom, belief, art, and craft); practical experience in collecting folklore. (3)

150. American Character in Film. An exploration of the American national character, using commercial films as a teaching tool. (3)

151. Main Currents in American Culture. Lower-division interdisciplinary seminar designed to synthesize, amplify, and enrich the content of a block of general courses taken concurrently as prerequisite to the seminar. (2)

SS (AI) 170. American Civilization. The fundamentals of American history. Successful completion of this course meets the American institutions requirement established by the state legislature. (5F,W,Sp) ©

HU 201. Thinking Historically: Regions and Times. Flexible course used to introduce students to the historical method by studying various regions and eras. (5Sp)

270. Aztecs, Incas, and Mayas. Art, culture, religion, and social organization of the high Indian civilizations of Latin America; the European discovery and subsequent conquest of the Incas, Aztecs, and Mayans. (4)

271. An Introductory Survey of Latin American Civilizations. One-quarter survey of Latin American history. Provides opportunity to learn about the history and modern development of Latin America. (4)

Upper Division

300. Sources and Literature of History. General introduction to the study of European, American, and Asian history. For all persons preparing to teach or write history. Prerequisite: freshman sequence. Taken in the sophomore year upon completion of prerequisites. (3)

PERIOD SURVEY COURSES

Europe

304. Greek History. Greek civilization to the Roman conquest, 146 B.C. Emphasizes political, social, intellectual, and artistic developments and contributions. (5)

306. Roman History. From the earliest times to the decline of the Roman Empire in the West in the fifth century A.D. (5)

308. History and Thought of the New Testament. Historical and intellectual context of the development of the New Testament. Character, ideas, and historical setting of the various documents. (3Sp)

309. History of Christianity. History of the Christian faith in the western world. (3)

311. Medieval Europe (A.D. 500-1500). Political, economic, social, and cultural developments during the Middle Ages. (3)

319. Music in Medieval Society. An interdisciplinary examination of the function of music in the worship, work, and leisure life of European medieval society. Documents, musical scores, and performances constitute the material to be studied in the course. No previous knowledge of music is necessary. (3)

321. Renaissance and Reformation (A.D. 1250-1600). The Italian Renaissance and the Reformation, their spread in Europe. Transition to modern Europe in political, economic, religious, social, and intellectual systems and values. (5)

322. Old Regime and French Revolution. Explores the history of Europe from 1648 to 1815. Examines the social, political, and economic developments that produced the French Revolution. Discussion of the Revolution in detail. (4F)

325. The Century of European Revolution: 1815-1917. Reaction, nationalism, imperialism, liberalism, and socialism against a background of politics, economics, and diplomacy. (3)

327. The Century of Total War: 1914-Present. Political and economic developments in Europe, America, Asia, and Africa since the end of World War I. (3)

330. History of East Central Europe: 1500-Present. Surveys the history of East Central Europe from the Reformation to the present. (3)

331. The Balkans Since 1350. Surveys history of the Balkans from 1350 until the present. Focuses on development of nationalism among the Balkan peoples and establishment of national states in the twentieth century. (3)

334. Kievan and Muscovite Russia. Origins of the Russian people and state, the disruption caused by the Mongol conquest, and the emergence of Muscovite society. (3)

335. Imperial Russia. Political, economic, and cultural development of the Russian people from Peter the Great to 1917. Analysis of the non-Marxian revolutionary movement. (3)

336. Russian Revolutions and Soviet Regime. Development of the Russian Revolution, and the economic/political development of the Soviet state from its founding to the breakup of the Soviet Union. (3)

338. Medieval and Early Modern Britain. Covering British history from ca. 830 until 1688, this course concentrates on political, legal, cultural, and religious development of England. No prerequisite. (4W)

339. The Rise and Fall of Imperial Britain—1688-Present. Traces the major themes in British history from the beginnings of the Empire through the emergence of the British Commonwealth after 1945. (4Sp)

341. Germany in Europe Since Frederich II. Development of modern Germany; the growth of Germany as an economic, military, and international power in the nineteenth and twentieth centuries. (3)

342. Germany in a Century of Total War. German defeat in 1918 led to the Weimar Republic, a democratic experiment leading to the Nazi Reich, which led to World War II. This course examines the process historically. (3Sp)

Africa

351. Traditional Africa. Geography, ethnology, and early history of Africa to the coming of the colonial powers. (3)

352. Colonial and Modern Africa. From the coming of the colonial powers, through the colonial period, to the present movements of independence. (3)

353. History of Southern Africa. The political, social, and economic history of Africa south of the Zambezi River, stressing the interaction of Negro, Khosian, and European cultures. (3)

Asia

358. Islamic Civilization 1600-Present. Surveys the Islamic world, from 1600 until the present. Particular attention paid to conflicting systems of self-identification among peoples of the Middle East. (3W,Sp)

360. Comparative Asian History. Survey course on the history of the Asian continent, analyzing common patterns in the cultures of West, South, Southeast, and East Asia. (4F)

361. Traditional East Asia. Development of the civilizations of China, Japan, and Korea from their origins to the time of the Ch'ing Dynasty in China. (3)

362. Modernization of East Asia. The modern transformation of traditional cultures of China, Japan, and Korea during the last two centuries. Emphasis on comparative modernization of China and Japan. (5)

367. History of China. Development of traditional Chinese culture and the effect on that culture of the growth of western influence. (3)

368. History of Japan. The development of Japan with a special emphasis on the modern transformation in the last century. (3)

369. Civilization of India. Survey of the history of Indian civilization from earliest times to the present. (3Sp)

Folklore

372 (d672).[1] Folklore Colloquium. Issues, problems, and methodologies in folklore study. (3) ®

General Education

IO 395. Environmental History. An examination of humanity's interaction with the environment throughout history and the origins and development of environmental conservation in the modern period. (3)

United States

422. Ballads and Folksongs. Study of the lyrics of traditional songs and ballads; theories of transmission, literary and historical importance, notable collectors and recordings. (3) ®

423. American Folklore. American folk art and literature and the historical and cultural circumstances from which they developed. (3)

424. American Folk Styles. In this survey of material culture, students learn techniques and perspectives enabling them to look at artifacts as texts to be deciphered for their historical, cultural, and aesthetic meanings. (3)

432. Colonial America. Survey of the British North American colonies from their founding to 1763. (5)

434. The New Nation. The course of American history from 1763 to 1800 with special emphasis on the American Revolution and the subsequent efforts to found the new government. (3)

436. Jefferson and Jackson. The survey of the political, social, and economic developments of the new nation from 1800 to 1850. Special emphasis is placed on the structure of the American party system, sectionalism, the abolitionists, and other reform groups. (3)

438. The Civil War and Reconstruction. An analysis of the most trying period in American history with special emphasis on the causes of the war and the results. (3) ©

442. Era of Wealth and Reform (1877-1916). The transformation of America from rural to an industrial and urban nation. Emphasis on economic change, political parties, and the populist and progressive reform movements. (3)

444. United States in War and Depression (1914-1945). American domestic and foreign history through the First World War, the Great Depression, and World War II. (3)

446. Recent America (1945-present). Domestic and foreign policy since World War II. Emphasis on the Cold War and the political and social developments of contemporary United States. (3) ©

447. Foreign Policy in the Pacific. An analysis of the contemporary foreign policies of the major countries surrounding the North Pacific. (See PolS 447.) (4)

449. History of Black America. The black in American history, from the background of early African civilizations, through slavery to freedom, and the difficult quest for democracy and equality. (3)

450. American Indian History. From colonial times to the present. Emphasis on the West. Effects of intercultural contacts and economic and political problems will be studied. (3)

452. American Military History. The history of the development of the American military establishment and its relationship to the changing American and global environment. (3)

455. The American West, 1803-1912. The history of the trans-Mississippi West of the United States from the Louisiana Purchase to the statehood of New Mexico and Arizona. (5)

456. The Twentieth Century West. Regional development of the trans-Mississippi West since 1900 with emphasis on environmental considerations, continuing frontier themes, and urban, economic, and cultural growth. (3)

457. History of Utah. Geography and native peoples, early explorations, political, social, and economic developments to the present. (5)

459. Folklore of Utah. Study of the lore of major Utah folk groups (ethnic and immigrant, occupational, religious, and regional). (3)

460. History of Women in America. Problems and purposes of women's history; changes in the role and status of women from colonial times to the present; rise of feminism, its relation to other reform movements, its leaders and critics. (3)

462. History of the Urban West. Introduction to urban history focusing on the development of selected western American cities, including Salt Lake City, and on recurrent urban problems and the ways these have been handled. (3)

464. American Religious History. Varieties of American religious experience from settlement through the present day. (3F)

465. Interpreting the Past for Teachers: Survey of Nonformal Educational Mediums in History. Survey for history teachers of nonformal mediums for interpreting the past: historical films, docudramas, sites, festivals, reenactments, simulation board and computer games, and fiction. (3Sp)

Latin America

471. Colonial Latin America. European exploration and conquest; Indians, Africans, and the emergence of Mestizo/Creole societies; the wars of independence and the final crisis of the colonial system. (3)

472. Modern Latin America. Aftermath of independence; civil wars, foreign interventions and the forging of new nations; U.S.-Latin American relations; and the political and social revolutions of the twentieth century. (4)

473. Contemporary Latin America. Present affairs and problems of each Latin American nation, providing insight within social, economic, and political realms, as viewed from various internal and external levels. (3)

474. History of Mexico. European conquest; the colonial system and the wars of independence; foreign invasions and the wars of the reform; Zapata, Villa, and the Mexican Revolution; the struggle for development, land, and justice in the modern era. (3)

Diplomatic History

476. The United States and Latin America. Diplomatic, economic, and cultural aspects of Inter-American relations; Latin American perspectives on the "Monroe Doctrine," "Manifest Destiny," "Dollar Diplomacy," and the "Good Neighbor;" current controversies over U.S. policy. (3)

478. United States and the European Community. The study of diplomatic relations between Europe and America from the American War of Independence to the present. (3)

Canada

481. History of Canada. From earliest times to the present. (3)

Directed Studies

489. Special Studies. An examination of special areas and themes in history. (1-3F,W,Sp) ®

491. Readings and Conference. (1-3F,W,Sp) ®

495. History of Scientific Thought. Examination of key episodes in the history of science and associated ideas about the nature of scientific knowledge and the ways it may be acquired. (4W)

499. Proseminar. A seminar emphasizing research and writing skills in selected topics in history. Prerequisite: Hist 300. (3)

ADVANCED UPPER-DIVISION THEME AND TOPIC COURSES

Europe

513. Economic History of Russia. Development of the Russian economy from earliest times to 1930, emphasizing the interaction between economic forces and policies of the state. (3)

United States

524 (d624). Regional Folklore. Regional folklore of a specific region, identified each quarter taught. (3) ®

IO 526. Legends, Myths, and Folktales. Substance and significance of folk prose narratives both in the past and in contemporary society. (3W) ®

541. Cultural History of the United States. A social and intellectual history of the United States with emphasis on the development of major thought patterns in relation to their social-economic context. (5)

543. The American Frontier. Upper-division interdisciplinary seminar designed to synthesize, amplify, and enrich the content of a block of general education courses taken concurrently as prerequisite to the seminar. (3)

545. Constitutional History of the United States. Survey of the evolution of our constitution's history; special emphasis on Supreme Court decisions and philosophies; concludes with analysis of constitution's role in contemporary society. (4)

546 (d646). Folk Groups and Folklore Genres. Survey of folk groups and folklore genres. Taught during Fife Folklore Conference only. (See English 546.) (3Su) ®

579 (d679). Folklore Fieldwork. Introduces advanced student to problems and techniques of fieldwork, including making sound recordings of orally-transmitted expressions, photographs of material traditions, and descriptions of problematic genres. Technical training, ethics, field exercises, analysis, plus perspectives on archiving and publication of results. (3)

British History

585. Special Topics in British History. (3) ®

Senior Professional Course

596 (d644). American West: Its Literature and History. (See English 596.) (2-3) ®

Graduate[2]

600 (f586). Historical Method and Research. (3)

601 (f588). Local History Methods. (3)

602. Historical Criticism: Practicum. (3)

603. Historiography. (3)

604. The Social and Economic History of Modern Europe. (3Sp)

605. Philosophy of History. (3)

610. Colloquium in Special Studies. (3) ®

612 (f592). Archives Management. (3)

613. Historical Editing. (3)

614. Historical Preservation. (3)

620. Colloquium in European History. (3) ®

621. European History. (1-5) ®

622. Folk Narrative. (3) ®

624 (d524). Regional Folklore. (3) ®

630. Colloquium in American History. (3) ®

631. American History. (1-5) ®

635. Colloquium in Western American History. (3) ®

637. Teaching Utah History. (3)

644 (d596). American West: Its Literature and History. (See English 644.) (2-3) ®

646 (d546). Folk Groups and Folklore Genres. (See English 646.) (3Su) ®

650. Colloquium in African History. (3) ®

651. African History. (1-5) ®

657. American Studies Internship in Mountain West Culture. (2-13) ®

660. Colloquium in East Asian History. (3) ®

661. Asian History. (1-5) ®

669. Themes in Folklore. (3F) ®

670. Colloquium in Latin American History. (3) ®

671. Latin American History. (1-5) ®

672 (d372). Folklore Colloquium. (3) ®

673. Studies in Folklife. (3) ®

674. Outdoor Museum Planning and Administration. (3)

675. Outdoor Museum Research and Conservation. (3)

676. Outdoor Museum Interpretation and Educational Programming. (3)

677. History Museum Internship. (6-12) ®

678. Scholarly Editing Internship. (2-6) ®

679 (d579). Folklore Fieldwork. (3)

689. Research Seminar. (3) ®

691. Readings and Conferences in Special Areas. (1-3) ®

697. Thesis Research. (1-9) ®

699. Continuing Graduate Advisement. (1-3) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing; parenthetical numbers preceded by an *f* are the *former* course numbers.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

Department of

Human Environments:

Apparel Merchandising, Interior Design, Consumer Sciences, and Family and Consumer Sciences Education

College of Family Life

Head: Professor Joan R. McFadden
Office in Family Life 303, 797-1558

Professors Leona K. Hawks, Jean M. Lown, Janet E. Preston; **Professor Emeritus** Alison C. Thorne; **Associate Professors** Jane L. McCullough, Marilyn B. Noyes, Tom C. Peterson, Elizabeth Rogers, JoAnn Wilson; **Associate Professor Emeritus** LaRae B. Chatelain; **Assistant Professors** Luella F. Anderson, Jeanette J. Arbuthnot, Elizabeth E. Gorham; **Assistant Professor Emeritus** Ruth V. Clayton; **Temporary Instructor** Louise P. Young; **Lecturers** Marty Cannon, Brent S. Windley; **Academic Adviser** Jan Moyes

Degrees offered: Bachelor of Science (BS) and Bachelor of Arts (BA) in Family and Consumer Sciences Education; BS and BA in Apparel Merchandising; BS and BA in Interior Design; Master of Science (MS) in Human Environments; and Human Environments specialization in the Family Life Doctor of Philosophy (PhD)

Area of specialization: Vocational Family and Consumer Sciences Education

Objectives

The Department of Human Environments offers three majors—Apparel Merchandising, Family and Consumer Sciences Education, and Interior Design. The department also offers the BS degree in General Family Life with two options; one allows a specialization, and the other requires a multidisciplinary approach.

Departmental Admission Requirements

Admission requirements for the Department of Human Environments are the same as those described for the University on pages 8-11. Students in good standing may apply for admission to the department.

A 2.5 grade point average is required in the major area. A grade of *C* or better must be earned in all major required courses. Courses required for the major may be repeated only once. *P/D/F* may not be used in major area courses or in supporting courses.

Courses required for the professional component of a program will be accepted if they have been completed within the past ten years. The current instructor of any course for which students need an update will work with students to meet this requirement. To provide a common base of understanding, all majors in the college need to complete 10-13 credits selected from the groups of courses listed in the College of Family Life section of this catalog.

Apparel Merchandising Major

A major in this area prepares students for positions in apparel merchandising and related industry and textile careers. It stresses the way fashions begin and are developed, how apparel is marketed, and how fashion businesses are operated. It includes a minor in marketing, involving coursework in management, marketing, sales promotion, retailing, and entrepreneurial activity.

The Marketing minor is recommended, but not required. An approved minor in another area may be substituted.

The suggested sequence for completing required coursework for the Apparel Merchandising Major with a Marketing minor is as follows:

Freshman Year: Engl 101 or 111; FL 110; HEnv 104, 105, 111, 112 (1 credit of 2 required); Psy 101 or Soc 101; Math 105; BIS 140; 5 credits of Physical Sciences; 5 credits of Life Sciences; 3 credits Family Life Core; 8-10 elective credits.* (45-47 total credits)

Sophomore Year: Engl 200 or 201; Acct 201; HEnv 112, 215, 224, 266; Econ 200, 201; 3 credits Family Life Core; 3 credits Life Sciences; 5 credits Life or Physical Sciences; 3 credits Integrative Option; select skills course; 5-7 elective credits.* (45-47 total credits)

Junior Year: HEnv 335, 336, 355, 374, 386, 396; MHR 311, 360; BA 350; Spch 105; Phil 111 or 326; 5-7 elective credits.* (45-47 total credits)

Senior Year: HEnv 406, 425 (6-12 credits), 467, 469; BA 451, 454, 455; 14-18 elective credits.* (45-47 total credits)

Tours. The apparel merchandising program sponsors an annual tour to a major fashion center. The tour may be taken for credit (HEnv 212). Students are encouraged to take advantage of this opportunity, however, it is not required.

Family and Consumer Sciences Education Major

This major provides professional preparation for teaching Family and Consumer Sciences Education and Occupational Home Economics in public schools, or for employment as a home economist in business or government agencies, and extension. Those planning to work in extension in many states, including Utah, require a master's degree.

The composite major includes study in nutrition and food sciences, family and human development, interior design, clothing and fashion, and consumer sciences, plus professional education courses.

Student teaching in secondary public schools is required. Internships in extension or business are available.

*Prerequisites needed for Business Administration courses are strongly recommended.

The suggested sequence for completing required coursework for the Family and Consumer Sciences Education Major is as follows:

Freshman Year: HEnv 103, 105, 125, 201, 210; FL 110; FHD 120, 150; NFS 122; BIS 140; Engl 101 or 111; Math 101; Psy 101; Phyl 130.

Sophomore Year: HEnv 202, 203, 215, 224, 265, 303, 304; NFS 222, 225; Chem 111, 141; Engl 200 or 201; 5 credits of American Institutions; 6 credits of Humanities. Students should also sign up for the child development lab experience and apply to secondary education during their sophomore year.

Junior Year: HEnv 255, 300, 303, 320, 349, 355, 361, 440, 445; FHD 304, 381; NFS 407, 408; Engl 301 or 305, or ScEd 306; Psy 366; ScEd 301, 404; 3 credits of integrative option or science.

Senior Year: HEnv 450, 460; FHD 455, 475; InsT 445, 447; SpEd 301; ScEd 302, 510.

Interior Design Major

The major in interior design has been developed to prepare an individual for entry into the profession of interior design. To this end, each student must identify, research, and creatively solve problems pertaining to the function and quality of the interior environment.

An interior designer performs services relative to interior spaces, both commercial and residential. These services include programming, design analysis, space planning, and aesthetics, using specialized knowledge of interior construction, building codes, equipment, materials, and furnishings. Another component of each student's training in interior design is the preparation of drawings and documents relative to the design of interior spaces, in order to enhance and protect the health, safety, and welfare of the public.

The suggested sequence for completing required coursework for the Interior Design Major is as follows:

Freshman Year: HEnv 101 (2 credits), 105, 125, 131, 135; FL 110; Art 102, 120; 11 credits of Learning Skills (to include BIS 140); 5 credits of American Institutions; 5 credits of Physical Sciences.

Sophomore Year: HEnv 101 (1 credit), 224, 232, 233, 234, 271, 281, 291; Engl 200 or 201; NFS 122; 6 credits of Art History (HU) 275, 276, or 277; 5 credits of Physical Sciences; 5 credits of Life Sciences; and one Art elective.

Junior Year: HEnv 101 (1 credit), 301, 309, 310, 311, 313, 321, 331, 332, 333, 371, 372; MHR 299; two Art electives; HEnv 425 should be taken after the junior year.

Senior Year: HEnv 101 (2 credits), 374, 401, 422, 434, 465, 471, 472, 473, 3 credits of HEnv electives (255, 349 or 355); 6 credits of Art electives (skills courses); Engl 301 or 305; 3 credits of FHD (SS) electives (120, 150, or 304); 3 credits of Life Sciences or Physical Sciences; LAEP (HU) 103; any other needed electives.

Sophomore Review. In addition to basic undergraduate and graduate requirements set forth in this catalog, students in Interior Design must participate in the Sophomore Review in order to matriculate to junior class standing. The review takes place during the latter part of winter quarter. Students wishing to enroll in junior level courses must first submit at least one project from each of the following courses: HEnv 125, 131, 135, 232, 233, 271, 281; Art 102, 120; one elective Art skills class. Students will be provided a space for the display of their portfolios. The manner in which the work is exhibited is at the discretion of the student and will be considered in the overall portfolio evaluation.

The second component of the sophomore review will be an analysis of the student's academic performance. Courses required for sophomore status are: HEnv 105, 125, 131, 135, 224, 232, 233, 271, 281, 291; Art 102, 120; six credits from Art 275 or 276 or 277; one Art skills course. The student's overall GPA will be used as part of the review process.

Students with a cumulative GPA of 3.0 or above will be automatically advanced to upper-division status following the successful completion of the first portion of this review. Students with a GPA of less than 3.0 will be accepted into upper-division courses as space permits, with higher GPA's being considered first, in addition to the successful completion of the first part of this review.

If a student who has been approved to take upper-division classes stops out of the program, he or she will be readmitted if space is available. Due to space limitations, first preference will be given to students with continuous registration in the program.

Tours. Each year the Interior Design program will sponsor a tour to a major design center. Students should plan to take advantage of this opportunity at least once while enrolled in the program.

Graduate Study

The MS in the Department of Human Environments encompasses programs in each of the four major areas of emphasis: clothing and merchandising, consumer sciences, family and consumer sciences education, and interior design. A specialization in Human Environments, with emphases in clothing and merchandising, consumer sciences, and family and consumer sciences education, is offered within the PhD in Family Life.

There are a variety of fellowships and assistantships available. Refer to the *Graduate Catalog*.

Human Environments Courses

101. Interior Design Professional Orientation Seminar. Weekly seminars to provide an orientation to the professional aspects of interior design. Exploration of related careers and professional societies; invited participation by outside speakers. (1F,Sp) ®

103. Basic Clothing Construction. Introductory level sewing techniques and use and care of sewing machines. Challenge Exam option available. No previous experience necessary. (3Sp) ®

104. Analysis of Ready-to-Wear. Factors involved in evaluating quality fabric and construction in manufactured apparel. (2Sp)

HU 105. Design in Everyday Living. Investigation of the basic elements and principles of design in relation to the living experiences of everyday life and the practical application of theory involved. (3F,W,Sp)

111. Introduction to Apparel Merchandising. An investigation of the components and language of fashion, including an analysis of the apparel industry and the vocational opportunities therein. (3F,W)

112. Apparel Industry Seminar. Seminar to provide students with professional direction, exploration of career possibilities, and information. Invited speakers from apparel merchandising related fields and interests. (1F) ®

125. Introduction to Interior Design. Exploring the basic philosophy of interior design. Analysis of the elements and principles of design when applied to interior spaces. Local field trips. (3F,W,Sp)

131. Interior Graphics I. Introduction to drafting tools, symbols, and techniques used in interior design presentation. Development of basic graphic communication skills. Three two-hour studios per week. (3Sp)

135. Design Theory. Impact of historic design theories as factors influencing contemporary design. Positive and negative evaluation of current trends. Three one-hour lectures per week. (3Sp)

200. Introduction to Family Financial Management Careers. Explores career opportunities in personal and family financial management services. (1-3Sp)

201. Concepts of Family and Consumer Sciences Education. Introduction to concepts needed for teaching in secondary Family and Consumer Sciences Education programs. The course will also include an overview of current trends in Family and Consumer Sciences Education. (3F,Sp)

202. Field Based Experiences for Preservice Teachers in Secondary Schools. Experience in a public school Family and Consumer Sciences Education department as a teacher's intern. Student must set up contract with college supervisor prior to experience. (3F)

203. Family and Consumer Sciences Education Professional Development Seminar. Seminars providing an orientation to the professional aspects of Family and Consumer Sciences Education. Exploration of related careers, exposure to practicing Family and Consumer Sciences Education professionals, current research reports, field trips, and career development. Two credits required. (1F,W,Sp) ®

210. Intermediate Clothing Construction. Intermediate level clothing construction techniques, pattern alteration, fit, and use of sewing machine and serger. Previous sewing experience necessary. (3F)

212. Apparel Industry Tour. Annually conducted tour to a national or international fashion center. (1Sp) ®

215. Wardrobe Management. Experiences in identification and coordination of apparel designs, fabrics, and accessories. General clothing care and wardrobe selection for men and women. (3F,Sp)

224. Basic Textiles. A study of fibers, yarns, fabric construction, and finishes as related to the appreciation, selection, use, and care of current textiles. Three lectures, one lab. (4F,Sp)

225. Introductory Internship. Introductory level experience in an internship position approved by the department. One credit for 50 hours of experience. Maximum of 6 credits. Sophomore standing. (1-6F,W,Sp,Su) ®

232. Interior Graphics II. Techniques and approaches to graphic presentations of interior design solutions. Floor plans, furniture layouts, shade, shadow, measuring, and detailing. Three two-hour studios per week. Prerequisites: HEnv 131; HEnv 271 taken concurrently. (3F)

233. Interior Graphics III. Introduction to three-dimensional drawing. Isometric and perspective. Development of methods of rapid graphic communication techniques. Three two-hour studios per week. Prerequisites: HEnv 232; HEnv 281 taken concurrently. (3W)

234. Interior Graphics IV. Techniques and approaches to complete professional presentations exploring various types of media and presentation techniques. Three two-hour studios per week. Prerequisite: HEnv 233. (3Sp)

IO 238. **Gender Roles in American Society.** An examination of the socialization of females and males for their expected roles in American society. (3F,W,Sp)

SS 255. **The Consumer and the Market.** The role of the individual and the family as consumers; consumer rights, decision making, and redress; the government, the market, and consumers as interacting agents. (3F,W,Sp)

265. Family Housing. Housing families in social, psychological, and physical environments. Influence of technology, economics, and community in housing acquisitions. Housing types, space allocations, and current trends. (3F,Sp)

266. Merchandising Math. Application of mathematics to the merchandising and control functions specific to careers in apparel merchandising. Prerequisites: Math 101, BIS 140. (3Sp)

271. Human Dimensions in Interior Design. Focus on the psychological, sociological, and special needs that influence the perception of spatial relationships. Three two-hour studios per week. Prerequisites: HEnv 131; HEnv 232 taken concurrently. (3F)

281. Color Theory. Physical and psychological attributes of color. Various color systems and the impact of color on the design process. Two one-hour lectures and one two-hour lab per week. Prerequisites: HEnv 105; HEnv 233 taken concurrently. (3W)

291. Interior Space Planning. Fundamental aspects of spatial organization of architectural elements and furnishings. One one-hour lecture and two two-hour studios. Prerequisites: HEnv 125, 131, and 234. (3Sp)

300. Residential Technology. Consumer selection, operation, use, and care of appliances and fixtures. Evaluation of performance, energy efficiency, materials, construction, quality, design, and cost. (3W)

301. Computer Aided Drafting and Design of Interior Spaces I. Basics of computer aided drafting and design for interior design students. One one-hour lecture and two two-hour labs per week. Prerequisite: HEnv 234. (3W)

303. Clothing Construction Technology. Techniques for selection of technology for sewing laboratories. (1Sp)

304. Fitting and Flat Pattern Design. Application of fitting and flat pattern theories and principles to achieve individual fit and design in garments. Prerequisites: HEnv 105, 210, or equivalent. (3F)

309. History of Interior Furnishings I: Ancients-Napoleon. Experience in identification of historical architectural spaces and elements, interior furnishings, and materials dating from Ancients through Napoleon. Three one-hour lectures per week. (3F)

310. History of Interior Furnishings II: English Renaissance-American Victorian. Identification of historical architectural styles and elements in interior furnishings and materials from English Renaissance through American Victorian. Overview of historic preservation. Three one-hour lectures per week. Prerequisite: HEnv 309. (3W)

311. History of Interior Furnishings III: Arts and Crafts through Contemporary. Contemporary architectural styles, interior furnishings, furniture, textiles, and materials from the late nineteenth century to the present. Three one-hour lectures per week. Prerequisite: HEnv 310. (3Sp)

313. Interior Materials. Identification of current interior materials; their characteristics, use, and care. Experience in specifications estimation, workroom procedures, and development of working resource file. Three one-hour lectures, one two-hour lab. (4F)

320. Speed Tailoring. Constructing a tailored jacket or short coat using speed tailoring techniques. Prerequisites: HEnv 210, 304, or equivalent courses. (3W)

321. Interior Lighting. Lighting design—types, techniques, and application of lighting for user needs in residential and contract spaces. Two one-hour lectures, one two-hour lab per week. Prerequisite: HEnv 331. (3W)

331. Design Studio Fundamentals. Analysis of various approaches used in problem solving. Graphic and verbal presentation of solutions with emphasis on evaluation. Three two-hour studios per week. Prerequisites: HEnv 234, 291. (3F)

332, 333. Interior Design Studio (Topic). Studio projects of varied complexity and type, including work in residential, hospitality, retail, medical, office, and other contract and institutional design. Three two-hour studios per week. Prerequisites: HEnv 331; HEnv 332 must be taken before 333. (3W) (3Sp)

335. History of Textiles and Apparel I. A survey of the major style periods in textile and apparel design from ancient times through Western Europe in the 16th century. (4W)

336. History of Textiles and Apparel II. A study of fashion changes in Western European textiles and apparel from the 17th century to the present. (4Sp)

349. Management and Decision Making. Values and goals in decisions concerning use of family resources. (3F,W)

351. Home Management Problems. Application of management theory through individual project. Prerequisite: HEnv 349. (4Sp)

SS 355. Family Finance. Managing family resources to achieve value-based financial goals. Consideration of financial alternatives available to families and factors determining financial decision-making. (3F,W,Sp) ©

359. Consumer Credit Problems. Examines consumer credit problems, debt reduction strategies, credit collection policies and practices, bankruptcy, and

government assistance programs. Prepares students for the Accredited Financial Counselor exam. (3W)

360. Financial Counseling. Focuses on methods and procedures to assist individuals and families of different socioeconomic groups in managing their money and resolving dysfunctional financial behaviors. (3Su)

361. Family Financial Management Software. Use and evaluation of computer software programs for DOS, Windows, and MacIntosh environments to address personal and family financial management, counseling, and planning questions and case problems. Prerequisite: HEnv 355. (3W)

371. Architectural Systems I: Basic Systems. Familiarization with the various systems incorporated into contemporary architectural construction and their interrelationships. Three one-hour lectures per week. (3W)

372. Architectural Systems II: Construction Drawings. Investigation of construction drawings and how to interpret them correctly. Terminology of the related professions. Building code implications. Three one-hour lectures per week. Prerequisite: HEnv 371. (3Sp)

374. Advanced Textiles. Evaluation of the physical, economic, and aesthetic properties of textile products to determine suitability for a desired end use. Two one-hour lectures and one two-hour lab per week. Prerequisite: HEnv 224. (3W)

386. Apparel Trend Analysis. Study of apparel as an object (design and construction) and a process (communication and marketing). Analysis of current fashion trends. Prerequisites: HEnv 111 or equivalent; HEnv 224. (3W)

396. Visual Merchandising and Promotion. Visual merchandising and special events production. Prerequisite: HEnv 105 or equivalent. (4W)

401. Computer Aided Drafting and Design of Interior Spaces II. Continued exploration and study of computer aided design with an emphasis on creative applications and proficiencies. Three two-hour labs per week. Prerequisite: HEnv 301. (3F)

406 (d606).[2] Behavioral-Science Concepts in Dress. Application of concepts from cultural anthropology, economics, psychology, and sociology to the study of clothing, personal appearance, and consumer behavior. Recommended: one sociology or psychology course. (3F)

414. Apparel Design. Designing apparel utilizing computer technology in addition to a variety of techniques and inspirational sources. Prerequisites: HEnv 103 and 210 or equivalent; HEnv 301 and 304. (3F)

415. Family Financial Management Career Seminar. Career options explored via readings, supervised discussion, attending seminars presented by professionals, developing interview surveys, interviewing practitioners, and developing a career plan. Permission of instructor required. (1-3F)

422. Professional Practice in Interior Design. Overview of business practices and principles for interior design including: salesmanship, marketing, client and trade relationships, establishing an interior design practice, and fee structure. Three one-hour lectures per week. (3F)

425. Advanced Internship. Midmanagement-level experience in a position approved by the department. One credit for each 40 hours of experience. Junior standing required. (1-12F,W,Sp,Su) ®

434. Interior Design Studio (Topic). Studio projects of varied complexity and type; including work in residential, hospitality, retail, medical, office, and other contract and institutional design. Three two-hour studios per week. Prerequisite: HEnv 333. (3F)

440. Teacher-Learning Strategies in Family and Consumer Sciences Education. Development of competency in curriculum planning, and skill and sensitivity in the use of various teaching-learning strategies and resources. Prerequisites: HEnv 201, ScEd 301, Psy 366 (or take concurrently). (4Sp)

445. Family and Consumer Sciences Work Education Programs. History and philosophy of applied technology education. Methods of successfully planning and maintaining Family and Consumer Sciences work education programs in secondary schools. (3W)

450. Curriculum Seminar. Must take concurrently with HEnv 460. Register with the instructor of HEnv 440 one quarter prior to student teaching. (3F) ®

455. Advanced Family Finance. Managing personal and family financial resources to achieve goals relating to investments, retirement, and estate planning. Prerequisite: HEnv 355. (3Sp)

460. Student Teaching in Secondary Schools. Must take concurrently with HEnv 450. Prerequisite: HEnv 440. (12F)

465. Housing Problems. Organization and use of space, house design, and remodeling for different family stages, handicapped, and aged. International shelter and housing problems compared. (3W)

467 (d667). Apparel Marketing Strategies. Application of effective apparel merchandising practices for small and large retail businesses. Prerequisites: HEnv 386, 396, BA 350, or consent of instructor. (3F)

469 (d669). Current Issues in Apparel Merchandising. Current problems in clothing and textiles. Focus is on topics of interest in Apparel Marketing. Prerequisite: senior standing. (3Sp)

471. Senior Design Project. Research, programming, schematics, development of construction documents, and a final project presentation. Three two-hour studios per week. Prerequisite: HEnv 434. (3W)

472. Interior Design Studio (Topic). Studio projects of various types with an emphasis on computer applications. Three two-hour studios per week. Prerequisite: HEnv 471. (3Sp)

473. Senior Review and Exhibition. Review and exhibition of completed projects. Prerequisite: HEnv 434. (2W)

480. Undergraduate Research. Directed research project conducted under the direction of a faculty member. Topic may be initiated by student or faculty. Approval of faculty required. (1-6F,W,Sp,Su)

490. Independent Study. Students must identify a project with the instructor before registering. (1-7F,W,Sp,Su) ®

550. Workshop (Topic). (1-3) [1] ®

561. Introduction to Software Usage. Basic operating system usage, word and graphic processing for VAX, IBM compatibles, and MacIntosh systems. (1F,Sp)

Graduate[3]

***602. Fashion Theory.** (3W)

****604. Research Trends and Presentation Techniques in Human Environments.** (3F)

****606 (d406). Behavioral-Science Concepts in Dress.** (3F)

612. Administration and Supervision in Family and Consumer Sciences Education. (3) [1]

615. Family and Consumer Sciences Education Classroom Management and Discipline. (3) [1]

617. Curriculum Development. (3) [1]

618. Curriculum Testing and Evaluation. (3) [1]

****620. International Apparel and Textile Trade.** (3)

622. Teaching Techniques for Human Sexuality. (3) [1]

625. Graduate Internship. (1-12F,W,Sp,Su) ®

***629. Family Economic Status.** (3F)

***630. Consumer Problems.** (3W)

***634. Advanced History of Textiles and Apparel I.** (4W)

****635. Family and Economic Change.** (3)

***636. Advanced History of Textiles and Apparel II.** (4Sp)

640. Current Perspectives in Family and Consumer Sciences Education. (3) [1]

645. Adult Education in Family and Consumer Sciences Education. (3) [1]

***649. History and Philosophy of Home Management.** (3F)

652. Consumer Studies Resources. (3F) [1]

****655. Consumer Credit.** (3Sp)

****656. Family Financial Problems.** (3F)

658. Design Methodologies in Interior Design. (5W)

662. Using and Interpreting SPSS to Analyze Social Research Data. (3F)

****665. Current Developments in Housing.** (3)

***666. Clothing and Merchandising Problems.** (3)

****667 (d467). Apparel Marketing Strategies.** (3F)

****669 (d469). Current Issues in Apparel Merchandising.** (3Sp)

670. Family and Consumer Sciences Education Colloquium. (1-3) [1]

671. Seminar. (1-3) ®

674. Advanced Textile Problems. (3W) [1]

****675. Current Issues in Research.** (3F)

***680. Research Methods in Human Environments.** (3)

690. Independent Study. (1-5F,W,Sp,Su) ®

692. Readings in Post-Occupancy in Interior Design. (1)

697. Thesis Research. (1-9F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-3F,W,Sp,Su) ®

700. Leadership in Vocational Education. (3) [1]

710. Theory in Human Environments. (3Sp)

733. Supervision Practicum. (3-12) [1]

775. Advanced Topics in Human Environments. (3W)

781. Research Seminar. (1-6) [1] ®

790. Independent Study. (1-9F,W,Sp)

797. Dissertation Research. (1-18) [1] ®

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[1]Offered as needed.

[2]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[3]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

*Taught 1996-97.

**Taught 1997-98.

Department of

Industrial Technology and Education

College of Engineering

Head: Professor Maurice G. Thomas
Office in Industrial Science 112E, 797-1795

Professor Jay C. Hicken; **Associate Professors** Ward P. Belliston, Reed M. Nielsen, Jr., Edward M. Reeve, Gary A. Stewardson, David P. Widauf; **Assistant Professors** Barbara A. Snoden, Charles E. Tinney; **Lecturers** Jerry L. Goodwin, Charles B. Larsen

Degrees offered: Bachelor of Science (BS) in Industrial Teacher Education with specializations in Technology Education and Trade and Technical Education; BS in Industrial Technology with specializations in AeroTechnology, Airway Science, Electronics/Computer Technology, Flight Technology, and Welding Engineering Technology; Master of Science (MS) in Industrial Technology

Associate of Applied Science (AAS) Degrees: Aviation Maintenance (A & P) and Drafting Technology

Objectives

The Industrial Technology and Education Department curricula are designed to prepare graduates for a wide array of teaching, technical, and supervisory positions.

The **Industrial Teacher Education** programs prepare graduates to be teachers in public schools, applied technology centers, and community colleges. **AeroTechnology** graduates fill aviation maintenance management positions in government and industry. **Airway Science** is a Federal Aviation Adminstration certified program to train individuals for careers in the FAA. **Electronics/Computer Technology** graduates fill technical positions in the electronic and computer industries. The **Flight Technology** curriculum prepares graduates to be professional pilots. **Welding Engineering Technology** graduates fill technical/management positions in the construction and fabrication industries.

Admission Requirements

Admissions requirements are commensurate with those outlined for the University (pages 8-11) with the exception that transferring students from General Registration or from another department or institution must be approved by a departmental admissions committee.

Professional Technology Program (PTP)

The Professional Technology Program (PTP) applies to the AeroTechnology, Electronics/Computer Technology, Flight, and Welding Engineering Technology majors. The purpose of this program is to provide a quality education for students by (1) requiring that they be fully prepared for upper-division coursework by having satisfactorily completed all required preprofessional courses, and (2) limiting enrollment in upper-division courses, consistent with resources available within the department and college.

Enrollment in upper-division ITE courses (300-level and above) is available only to students who have been accepted into the PTP or into an appropriate graduate program, or to students with a non-ITE major requiring a specific class.

To be eligible to apply for admission to a professional program, a student must be in good academic standing in the University and college, must achieve a grade of *C-* or better in every required preprofessional course, and must have an overall grade point average of 2.3 in required preprofessional coursework completed at USU.

A student can repeat no more than three of the required preprofessional courses in order to satisfy the PTP application and eligibility requirements. Multiple repeats of the same course are included in the total of three repeats. Audits count as a time taking a class unless prior written approval is obtained from the college academic adviser.

Although transfer credit accepted by the department and college may be applied toward PTP admission requirements, the grades received will not be used in the USU GPA calculation. A final decision on admission of a transfer student into the PTP will not be made until after the applicant has completed at least 15 credits of acceptable coursework at USU.

Eligible students must apply for admission to the PTP during the quarter in which they are completing the required preprofessional courses. Students may request permission to take a limited number (not to exceed 15 credits) of upper-division courses if they are within 10 credits of completing the necessary requirements, have submitted a PTP application, and are registered for all remaining preprofessional courses; however, the final decision rests with the appropriate department head and the college academic adviser.

For all technology majors in the Professional Program, the following academic regulations apply in addition to University regulations:

1. A minimum GPA of 2.0 must be maintained in technology/math/science/business courses required for, or used as technical electives in, the chosen major. Courses which were part of the preprofessional program requirements and general education courses are not included in this GPA calculation.

2. No more than 10 hours of *D* or *D+* credit may be applied toward meeting graduation requirements in technology/math/science/business classes.

3. College of Engineering courses may be repeated only once. Audits count as a time taking a class unless prior written approval is obtained from the department head. A maximum of three required or elective courses completed as part of a Professional Program can be repeated in order to meet graduation requirements. (Courses completed as part of a preprofessional program are not included in this total of three repeats.)

4. The *P-D-F* grading option may not be used in required or elective courses completed as part of a Professional Program. (The *P-D-F* grading option is approved for General Education courses.)

5. The academic regulations listed above (1-4) apply to required coursework and any technology/math/science/business course which could be used to satisfy graduation requirements for the chosen degree. That is, once a student completes a particular technical elective, it becomes a required course for that student.

6. Students in violation of departmental or college academic regulations, no longer eligible for graduation, or not making satisfactory progress toward a degree, will be placed on probation.

a. Students will be placed on probation if they (i) earn an *F* in a technology/math/science/business course which could be used to satisfy graduation requirements for the chosen degree (see item 5 above); (ii) have more than 10 hours of *D* credit (see item 2 above); or (iii) have a GPA of less than 2.0 (see item 1 above).

b. Students remain on probation until they improve their standing by repeating and passing all failed classes, repeating classes to reduce the number of *D* credits to 10 or less, and/or by raising their GPA above 2.0.

c. While on probation, a student must earn a quarterly GPA of 2.0 or higher in technology/math/science/business classes and must not earn any *D*'s or *F*'s.

While on probation, a student may not preregister. The student's major code will be changed to a preprofessional code. The student must meet at least quarterly with the College Academic Adviser to work out a schedule having the primary goal of correcting the existing academic problems.

Requirements

Bachelor of Science in Industrial Teacher Education

Technology Teacher Education. This option prepares the student to teach in junior and senior high schools. The curriculum requirements include the following: ITE 100, 101, 102, 103, 104, 120, 121, 133, 164, 171, 201, 202, 203, 230, 303, 305, 322, 352, 372, 375, 443, 450, 460, 504, 521, 522, 524, 550, 580; Math 105, 106; Chem 101; Engl 101, 201, 301; InsT 445, 447; Phyx 101; Psy 101, 366; ScEd 301, 302, 404, 510; and SpEd 301. Students in this degree also take General Education courses and electives. See major requirement sheet, available from the department, for further information.

Trade and Technical Teacher Education. This option prepares the student to teach vocational courses at the high school or post high school level. The curriculum requirements include the following: basic and advanced technical and trade courses, 70 credits; professional courses, 33-39 credits; general education, 49 credits; and general electives, 34 credits.

State certification requires a minimum of two years of approved vocational experience. Successful completion of a trade competency examination or industry school courses is accepted in lieu of vocational experience.

Bachelor of Science in Industrial Technology

AeroTechnology Specialization. Graduates of the AeroTechnology program are qualified to enter the work force in many rewarding career fields in aviation. Employment opportunities exist in target industries such as major airline carrier maintenance management, commuter airline maintenance management, fixed-base operator (FBO) maintenance, and Federal Aviation Administration (FAA) aircraft inspection after some field experience. The program has a great deal of depth in general maintenance, which applies to most industrial maintenance operations. Although the program's focus is aviation, the knowledge and skills gained can be used in other fields.

The courses for the **AeroTechnology** specialization are as follows: ITE 100, 113, 114, 117, 118, 120, 121, 124, 125, 133, 140, 144, 210, 211, 212, 214, 215, 217, 218, 219, 220, 230, 231, 237, 243, 312, 314, 328, 333, 340, 341, 382, 419, 420, 430, 441, 458, 568; BA 370; BIS 140; Chem 111; Engl 101, 201, 305; Math 105, 106; MHR 311, 360; Phyx 111, 112; Stat 230.

Electronics/Computer Technology Specialization. Students choosing the Electronics/Computer Technology option are trained for positions in industry as liaison technologists between the design engineer and production personnel. These positions are available in field engineering, test engineering, quality control engineering, and design engineering, to mention a few.

The courses for the **Electronics/Computer Technology** specialization are as follows: ITE 100, 103, 120, 121, 133, 140, 144, 205, 230, 231, 232, 237, 240, 337, 338, 340, 341, 352, 437, 456, 458, 482, 568; BA 370; Chem 111; CS 101, 170, 171, 227;

Engl 101, 201, 305; Math 106, 215, 216; MHR 311, 360; Phyx 111, 112, 113; Spch 105; Stat 230, 508. Ten credits of upper-division technical electives are also required; see adviser for details.

The **Flight Technology** specialization prepares graduates to be commercial pilots. The degree requirements include completion of the following FAA licenses: private, instrument, commercial, CFI, CFII, and Multi-Engine. The courses for this specialization are as follows: ITE 100, 113, 144, 217, 218, 230, 233, 234, 235, 243, 251, 252, 254, 262, 264, 266, 272, 274, 284, 286, 288, 302, 304, 312, 314, 316, 426, 428, 448, 449, 580; Engl 101, 201; Spch 105 or Engl 305; BIS 140; Math 105, 106; Chem 111; Phyx 111, 112; Bmet 200, 325.

In addition, either a Management Minor or a Human Resource Management Minor is required for this major. Required courses are listed below. The College of Business requires students to have a cumulative GPA of 2.5 to be admitted to these courses.

Management Minor. The following courses are required and must be taken early in the program: MHR 311, 313. In addition, five courses must be selected from the following: MHR 360, 361, 362, 435, 470, 476. Note: MHR 313 must be the *first* course taken in the program.

Human Resource Management Minor. The following courses are required: MHR 311, 312, 455, 463, 469, 476; Econ 566 or BIS 435; Econ 521. Note: MHR 312 must be the *first* course taken in the program.

A GPA of 2.5 or higher must be earned in the classes used for the minor. The cost of flight instruction is paid by the student.

Airway Science

The Federal Aviation Administration has designated USU as an Airway Science institution for its programs in aircraft maintenance management and electronics. Similar designation in the Aircraft Systems Management area (for professional pilots with a science and technology background) is pending. This designation gives graduates priority in employment in FAA careers. See the department for details.

Welding Engineering Technology Specialization. Utah State University offers one of the few BS degree programs in the nation in Welding Engineering Technology. Students choosing this program of study are trained for entry-level positions in the industrial setting as welding engineers, welding engineering technologists, welding technologists, quality assurance technologists, or as manufacturing technologists. They are prepared to work in field construction, light and heavy shop fabrication, and in manufacturing/production. They are trained in new process development, code and noncode high-quality applications, problem solving, technical sales, inspection, and estimating.

The courses for the **Welding Engineering Technology** specialization are as follows: ITE 100, 120, 121, 133, 144, 164, 165, 185, 230, 231, 237, 267, 285, 306, 309, 325, 333, 352, 363, 367, 382, 420, 430, 456, 464, 568, 574, 575, 576, 580; BA 370; BIS 140; Chem 111; CS 170; Engl 101, 201, 305; MAE 211; Math 105, 106, 220, 221; MHR 311, 360; Phyx 111, 112; Spch 105; Stat 230, 508.

Associate of Applied Science Vocational-technical Programs

The two-year curricula develop strong vocational skills in one of two areas of specialization—aeronautics or drafting. Most of the credits earned in these programs may be applied toward a related BS degree should the student decide to continue his or her education.

Airframe and Powerplant Technician Associate of Applied Science Degree Program. The two-year technical program leads to either an Associate of Applied Science (AAS) degree or a certificate. Required courses are: ITE 113, 114, 117, 118, 120, 124, 125, 133, 144, 210, 211, 212, 213, 214, 215, 217, 218, 219, 220, 230, 231, 242, 243, 244, 328, 420; Chem 111; Math 105, 106. General Education credits (26) are required for the AAS degree as described on pages 22-26. Federal Aviation Administration airframe and powerplant certification is available without general education requirements. See requirement sheet, available from the department, for further details.

Drafting Technology Two-year Associate of Applied Science Degree Program. A two-year technical drafting and design program leading to an AAS degree is available to those desiring to directly enter the drafting and design occupation. The program emphasizes computer aided drafting and design. Curriculum requirements include the following: ITE 101, 103, 120, 121, 133, 201, 232, 320, 322, 323, 324, 325, 327, 493; BIS 140; LAEP 103; Econ 200; Math 105, 106; and Engl 101, 201. Students in this program also fulfill General Education Requirements and complete technical electives and other electives. See requirement sheet, available from the department, for further details.

Graduate Study

The Master of Science (MS) degree is available to individuals interested in graduate study. Programs are offered in Industrial Teacher Education and Technology. Candidates can choose either the Plan A thesis option or the Plan B nonthesis program.

For additional information on the programs for these degrees, see the *Graduate Catalog*.

Industrial Technology and Education Courses

100. Orientation. Introduction to the technology education profession, including programs, facilities, purposes, and opportunities. (1-2F)

101. Introduction to Communication Technology. Survey of basic communication systems including: data communications (computers), technical design, optic systems, graphic production, and audio/visual systems. (3F)

102. Energy/Power/Transportation Technology Education. Exploration of the concepts and processes relating to the source, conversion, transmission, and control of energy relating to use in industry, domestic, and transportation. (3W)

103. Material Processing Systems. An introduction to properties of industrial materials (metallic, polymeric, ceramic, and composite) and processes used to produce standard stock and finish products. (3F,Sp)

104. Construction Technology Education. Exploration of the materials, processes, and management of the construction industry. (3W)

113. Flight Principles. Basic flight theory and physics of flight, aircraft control systems related to flight. Ground handling and servicing of aircraft. Special lab fee. (2F)

114. Aircraft Science. Materials and hardware, nondestructive inspection applicable to aircraft. Plumbing methods, maintenance publications, and aircraft weight and balance control. (3F)

117. Aerospace Structures. Accepted methods and repair for metal and composite structures aircraft. Organic finishes and application techniques. (3F)

118. Aircraft Structures Laboratory. Laboratory applications and practical experience with subjects covered in ITE 117. (2F)

120. Drafting. Lettering, print reading, geometric construction, sketching, multiview drawings, pictorials, dimensioning theory and practice, sectional views, and auxiliary views. (3F,W)

121. Computer Aided Drafting. Fundamentals of computer aided drafting, preparation of industrial working drawings, and plan reading. Prerequisite: ITE 120. (3F,W,Sp,Su)

124. Aircraft Maintenance. Maintenance, repair, alteration, and inspection of aircraft. Assembly and rigging of control systems. Prerequisites: ITE 113, 114. (3Sp)

125. Aircraft Maintenance Laboratory. Application of maintenance procedures studied in ITE 124. Prerequisites: ITE 113, 114. (3Sp)

133. Digital Logic. Study of number systems, base two, octal, hexadecimal, logic gates, flip flops, counters, and Boolean algebra concepts, combinatorial and sequential logic. (3W)

140. Introduction to Semiconductors. Principles, characteristics, parameters, specifications, and applications of semiconductor devices. Prerequisite: ITE 231. (3Sp)

144. Hydraulics and Pneumatics. Principles of hydraulics and pneumatics; the components and circuitry used in transferring fluid energy. (2F)

164. Shielded Metal Arc Welding. Theory, equipment, and skills traning for shielded metal arc welding. (3Sp)

165. SMA Welding Certification. Development of welding skills to meet the AWS D1.1 Code. Course may be repeated for maximum of 12 credits. Prerequisite: ITE 164. (3W) ®

171. Technical Woods. Operation of basic machine woodworking equipment with study of their uses and nomenclature. (3W)

185. Mechanics and Properties of Materials—Statics. Resultants and equilibrium of force systems, moments of inertia, method of work. Prerequisite: Math 221. (5W)

201. Graphic Communication Technology. Focuses on visual communication technology. Emphasis is placed on the design, development, production, and dissemination of graphic messages. Prerequisite: ITE 101. (3Sp)

202. Energy/Power/Transportation Technology Education. A level two course to continue the exploration of energy/power/transportation, with emphasis on automation related to industry and transportation. Prerequisite: ITE 102. (3F)

203. Manufacturing Technology Education. A level two course emphasizing materials and processes with applications to manufacturing including modeling, process sequencing, production, and automation. Prerequisite: ITE 103. (3Sp)

205. Digital Circuits Technology. Study of logic families, flip flops, counters, encoders, decoders, multiplexers, and registers. Prerequisite: ITE 133. (3F)

210. Aerospace Propulsion Systems. Theory of operation, maintenance, and repair of reciprocating, turbine, and rocket propulsion engines. (4F)

211. Aircraft Powerplant Laboratory. Application of principles and components studied in ITE 210. (3F)

212. Aircraft Powerplant Accessories. Operation, maintenance, and repairs of powerplant accessories. (5W)

213. Aircraft Powerplant Accessories Laboratory. Laboratory applications of principles and components studied in ITE 212. (4W)

214. Aircraft Powerplant Maintenance. Operation of powerplants, including inspection, servicing, propeller operation, and maintenance. (5Sp)

215. Aircraft Powerplant Maintenance Laboratory. Laboratory application of principles and components studied in ITE 214. (4Sp)

217. Aerospace Systems. Theory and operation of aerospace environmental systems, communication, navigation and guidance systems, fuel and propellant systems, fire detection, and warning. (3W)

218. Aircraft Hydraulics, Landing Gear, and Brakes. Theory and operation of aircraft hydraulic, landing gear, and brake system. Prerequisite: ITE 144. (3W)

219. Aerospace Systems Lab. Laboratory application of principles and components studied in ITE 217. (1W)

220. Aircraft Hydraulics, Landing Gear, and Brakes Lab. Laboratory application of principles and components studied in ITE 218. (1W)

225. Internship. Planned supervised work experience in industry. Must be approved by the department. (1-6F,W,Sp,Su) ®

227. Computer Engineering Drafting. Utilization of microcomputer to prepare basic engineering drawings. (3F,W,Sp,Su)

230. Electronics. Systems, components, circuits, measurements, laws, and construction practices related to DC electricity. Prerequisite: Math 105. (3F)

231. Electronics. Principles, circuits, laws, measurements, components, energy sources, and applications related to AC electricity. Prerequisites: ITE 230 and Math 106 or equivalent. (3W)

232. Electronic Drafting and Fabrication. Fundamentals of electronic drafting, layout, and construction. Includes printed circuit development and project fabrication. Prerequisites: ITE 121 and 133. (3Sp)

233. Private Pilot Ground School. Instructions in principles of flight, aircraft and engine operation, weather, navigation, radio aids to navigation, radio communications, and federal air regulations. Preparation for FAA Private Pilot written exam. (4F,Sp)

234. Solo Flight. FAA approved flight training program from first flight through solo flight. Prerequisite: ITE 233. (1F,W,Sp,Su)

235. Private Pilot Certification. FAA approved flight training program meeting all requirements for, and in the issuance of, the Private Pilot Airplane License. Prerequisite: ITE 233. (2F,W,Sp,Su) ®

237. Microprocessors I. Introduction to the architecture, organization, terminology, and machine language programming of microprocessors. Prerequisite: ITE 133. (3Sp)

238. Pulse Circuits. Study of RC and RL networks, differentiators, integrators, RC stepped attenuators, clippers, clampers, and the switching characteristics of diodes and transistors. (3)

240. Basic Electronic Circuits. Principles and applications of selected circuits, such as power supplies, amplifiers, oscillators, etc., commonly found in a wide variety of electronic devices. Prerequisite: ITE 140. (3F)

242. Regulations, Records, and Certification. Maintenance forms, records, and regulations releasing aircraft to airworthy status. Certification of maintenance technicians is also included. (2Sp)

243. Aircraft Electrical Systems and Equipment. Aircraft electrical power generating systems. Theory of generation, alternators, regulation, and control systems. Prerequisite: ITE 230. (3Sp)

244. Aircraft Electrical Systems Laboratory. Laboratory application of principles and systems studied in ITE 243. Prerequisite: ITE 230. (3Sp)

251. Intermediate Flight. FAA approved flight training program that fulfills the cross country requirements for commercial and instrument ratings. Prerequisite: ITE 235. (2F,W,Sp,Su)

252. Instrument Ground School. Instrument flight procedures including air traffic control, navigation, charts, meteorology, emergency procedures, and decision making. Prerequisite: private pilot license. (3F)

254. Instrument Certification. FAA approved flight training program meeting all the requirements for, and the issuance of, the Instrument Pilot Airplane Rating. (3F,W,Sp,Su)

262. Commercial Pilot Ground School. Commercial flight operations including performance, cross country planning, advanced systems operations, complex airplanes, and flight maneuvers. Prerequisite: private pilot license. (3Sp)

264. Commercial Flight. FAA approved flight training program meeting all the requirements for complex airplane operations. (2F,W,Sp,Su)

266. Commercial Pilot Certification. Flight instruction to meet FAA requirements and completion of tests for certification. Prerequisite: Private pilot certificate. (2F,W,Sp,Su) ®

267. GTA, GMA, and FCA Welding. Theory, equipment, and skills training for GTA, GMA, and FCA welding. (3Sp)

272. Certified Flight Instructor Ground School. Fundamentals of instruction, aerodynamics, airplane performance, systems, weather, Federal Aviation Regulations, navigation, flight physiology, and preparation for the FAA Instructor Airplane written exams. Prerequisites: ITE 264 and 266. (3F)

274. Certified Flight Instructor Certification. FAA approved flight training program meeting all the requirements for, and the issuance of, the Certified Flight Instructor, Airplane, Rating. (2F,W,Sp,Su)

284. Certified Flight Instructor Instrument Ground School. Advanced airplane instruments, weather, Federal Aviation Regulations, navigation, Air Traffic Control, IFR charts, and preparation for the FAA Instrument Instructor written exam. Prerequisites: ITE 264 and 266. (3W)

285. Mechanics and Properties of Materials—Solids. Stress, strain, and deflection due to tension, compression, and torsion. Mohr's circle for stress and strain. Prerequisite: ITE 185. (3Sp)

286. Certified Flight Instructor Instrument Certification. FAA approved flight training program meeting all the requirements for, and issuance of, the Certified Flight Instructor, Airplane, Instrument Rating. (1F,W,Sp,Su)

288. Multi-Engine Certification. FAA approved flight training program meeting all the requirements for, and the issuance of, the Multi-Engine Airplane Rating and the Certified Flight Instructor Multi-Engine Airplane Rating. Prerequisite: ITE 266. (3F.W.Sp.Su)

302. National Airspace Systems and Control. Study of the national air traffic control system, airspace usage, and facilities. Five-credit option available only to students taking course on the semester calendar through Distance Learning. (3-5F,W)

303. Field-based Experience. Field-based experiences in secondary schools prior to student teaching. Students complete 30 hours of tutoring and aid teachers with managerial, clerical, and other professional tasks. Prerequisite: ITE 100. (2F,W,Sp)

304. Flight Safety. Development of flight safety programs, techniques and procedures of accident investigation, human factors and limitations, effects of weather, hazards related to trans-atmospheric flight operation. Five-credit option available only to students taking course on the semester calendar through Distance Learning. (3-5F,W)

305. Electronic Communication Technology. Introduction to the principles, components, and operation of modern electronic communication systems. Emphasis is placed on the design, production, and transmission of electronic messages. (3Sp)

306. Codes—ASME and AWS. Study of ASME and AWS codes as they relate to procedure qualification and welder qualification for the fabrication of pressure vessels and structures. Prerequisite: ITE 267. (3F)

307. Technology Education for Elementary Schools. Introduction to Technology Education and to Science, Technology, and Society (STS) curricula for elementary schools, with emphasis on teaching, developing, and managing technology-based activities. (3Sp)

309. Welding Power Sources. Study of power sources used to generate and control voltage and amperage for welding. Prerequisite: ITE 267. (2W)

312. Aviation Law. Law as it affects the aviation industry. Rights and responsibilities of individual organizations and the aviation community. Regulations and liability pertaining to the design, manufacture, operation, and maintenance of aircraft. (3F)

314. Advanced Avionics Systems. In-depth study of the state of the art flight deck instrumentation systems (i.e. GPS, RNAV, EFIS, and HSI). (3Sp)

316. Advanced Flight Simulation. Study of aircraft systems specific to the Saberliner. Flight instruction in the T-40 simulator. Emergency preparedness, CRM, and advanced aircraft systems. (3W)

320. Descriptive Geometry. View relationships, spatial visualization, and problems relating to points, lines, and planes. Prerequisite: ITE 120. (3W)

322. Architectural and Construction System. Principles of residential and commercial design, construction system, and working drawings. Prerequisites: ITE 120, 121. (3F)

323. Machine Drafting. Techniques, symbols, conventions used in representation of gears, cams, jigs, and fixtures. Prerequisites: ITE 121 and Math 106. (3F)

324. Technical Illustration. Methods of converting orthographic drawings into three-dimensional drawings. Shading, inking, and airbrush techniques are introduced. Prerequisite: ITE 121. (3Sp)

325. Geometric Dimensioning and Tolerancing. Advanced techniques of production drawings; details, assembly production dimensions, tolerances, geometric dimensioning and tolerancing, classes of fits, surface quality, and specification. Prerequisite: ITE 121. (3W)

327. Advanced Computer Aided Drafting. Advanced methods of preparing industrial drawings using microcomputers. Prerequisite: ITE 121 or 227. (3Sp)

328. Advanced Turbine Engines. Advanced study of turbo-jet propulsion. Comparative examination of jet, fan jet, turbo-prop, and turbo-shaft engines. Prerequisites: ITE 210, 214, and 215. (3F)

333. Total Quality Management. Develops an understanding of the quality improvement process and gives the student skills in the use of quality program tools. (3Sp)

337. Electronic Devices II. Study of LED, Varactor, Diac, Zener, Thyristor, U.J.T., Fet, Mosfet, phototransistor, optocouplers, and isolators. Prerequisite: ITE 240. (3W)

338. Microprocessors II. Assembly language programming, busing, timing, I/O, PIAs, printer subroutines, and logical operations in solving real world and community problems. Prerequisite: ITE 237. (3F)

340. Communications Circuits. Study of AM and FM transceivers. Prerequisite: ITE 240. (3W)

341. Communications Circuits II. Transmitters and receivers, both AM and FM, modern frequency modulation and demodulation, transmission lines and cables, waveguides, and radio wave propagation. Prerequisite: ITE 340. (3Sp)

352. Computer-Integrated Manufacturing Systems. An introduction to the principles, operations, and applications of computer controlled manufacturing systems including CNC, CAD/CAM, robotics, programmable controllers, bar code readers, etc. Prerequisite: ITE 103. (3F,W)

363. Advanced Fusion Joining Processes. A study of the SAW, ESW, EMAW-EG, RW, PAW frequency, electron beam, laser, friction, and other welding processes. Prerequisites: ITE 165 and 267. (5F)

367. Design for Welding. Design of weldments. Prerequisite: ITE 285. (3Sp)

371. Industrial Woods. Applications of materials and processes considered new in the woodworking industry, including laminating, plastics in furniture, electronic gluing. Prerequisite: ITE 171. (3F)

372. Construction of Structures. Specifications, regulations, and building codes applied to construction; estimating, layout, and practical experience in construction of structures. Prerequisite: ITE 171. (3Sp)

374. Facility and Equipment Maintenance. Systems approach to facility, equipment, and tool maintenance including principles of woodworking machine construction, adjustment, and sharpening. (3Sp)

375. Alternative Energy and Energy Systems. Principles and application of alternative power and energy systems, including solar thermal, wind power, and biogas. Prerequisite: ITE 202. (3Sp)

382. Nondestructive Testing Principles. Fundamental concepts relating to liquid penetrant, magnetic particles, ultrasonic, radiographic, and other NDT processes. Prerequisites: Math 106 and Phyx 112. (5W)

390. Principles and Objectives of Industrial Education. A comprehensive study of the philosophy and purposes of industrial education programs and their place in the total program of modern education. (3)

391. Occupational Analysis. Student completes an analysis of one unit of a trade or occupation. Individualized, student-paced instruction. (3)

392. Organization and Development of Instruction Materials. Principles and practice in analyzing occupations for instructional purposes. The selection and arrangement of instructional materials to be used in planning industrial education coursework. (3)

393. Evaluation of Industrial Subjects. Evaluation factors including attitudes, skills, work habits, technical information, and instrument construction for evaluation of the above. (3)

394. Training Supervision. Provides experience in a variety of industrial training, qualification, and supervision situations. Prerequisites: upper-division status and permission of instructor. (1-3)

419. FAA/Airline Maintenance Operations. Develops an understanding of maintenance operations for medium and large airlines. Includes interfacing with the Federal Aviation Administration. (3W)

420 (d620).[1] Composite Manufacturing Processes. Composite manufacturing processes, composite materials survey, tooling design and fabrication, autoclave processes, vacuum bag techniques, filament winding processes, equipment requirements, materials cutting and storage, composite materials testing. Prerequisite: Chem 111. (4W)

424. Internship. Planned work experience in industry, related to the selected option. A maximum of 6 credits per school year and 12 credits for the course recommended. (1-6F,W,Sp,Su) ®

426. Airport Planning and Administration. Airport planning, development, and management and their importance to the achievement of a successful airport operation. Management of publicly owned and operated airports, ranging in size from general aviation to the large air carrier hubs. Five-credit option available only to students taking course on the semester calendar through Distance Learning. (3-5F,W)

428. Airline Operations. In-depth study of airline operations and their organizational structure. (3Sp)

430 (d630). Corrosion and Corrosion Control. Analysis of the mechanisms of corrosion of ferrous metals, nonferrous metals, and nonmetallic materials and the control of corrosion. Prerequisites: Chem 111, Math 106. (3Sp)

437. Microprocessors III. Operating system, application, interfacing, and troubleshooting of microcomputers. Prerequisite: ITE 338. (3W)

441. FCC License. Prepares students to obtain the FCC General Radio Telephone Operator's License. Covers electronic fundamentals through microwave, radar, and FCC rules and regulations. (3Sp)

443. Methods in Industrial Education. Techniques of teaching as applied to individual and group instruction. Students have opportunity to use these different methods in presenting lessons. Prerequisite: admission to teacher education and ScEd 301. Three-credit option available only to students taking course off campus. (3-4F)

448. CFI Practicum. Actual experience teaching private pilot ground school or teaching simulator procedures to USU students. Supervised and graded by University instructors. Prerequisite: ITE 274. (3F,Sp)

449. Human Factors in Flight. In-depth study of relationship between people and aircraft cockpit operations. Studies psychological and physiological limitations of humans in the cockpit. (3W)

450. Secondary Curriculum Seminar. Focus upon problems arising during student teaching. Includes teaching plans, procedures, adaptive classroom practices, and evaluation. To be taken concurrently with ITE 460 (see ScEd 450). (3W) ®

456 (d656). Industrial Robots. Principles, operation, and application of robots to material handling, assembly, and joining processes. Includes hardware and software applications for industrial technology. Prerequisite: ITE 352. (3Sp)

458. Occupational Safety and Health Management. Management practices and principles as applied to safety and health ethics, laws, organizations, programs, and varied functions of the safety and health professional. (2Sp) ©

460. Student Teaching in Secondary Schools. Candidates assigned to cooperating teachers in the public secondary schools in their major and/or minor subjects. Students will have professional responsibilities associated with teaching (see ScEd 460). (12W)

464 (d664). Tooling for Automation. Design and application of jigs, fixtures, and material handling devices for automated manufacturing. Includes clamping, positioning, nesting, locating, supports, part feeding, indexing, and orientation selection and rejection. Prerequisite: MAE 211. (3W)

470. Student Teaching in Postsecondary Schools. Planning, presenting, and evaluating instruction for students in postsecondary industrial and technical programs under supervision of experienced teacher. Enrollment by permission only. (1-6F,W,Sp,Su)

472. Reliability and Quality Control/Quality Assurance. Probability and the application of statistical methods to reliability, process control, and acceptance sample. Includes control charts, tolerances, acceptance sample. Prerequisite: Math 216. (3)

482 (d682). Manufacturing Control Systems. Automated manufacturing systems are studied with emphasis on the individual components of the systems and the interactions between components through feedback control systems. Prerequisites: ITE 237, 352, 464; and Math 216. (3Sp)

493. Independent Study. Upon application, students may propose and complete work above and beyond regular coursework to support or supplement their major. (1-6F,W,Sp,Su) ®

494. Related Industrial Experience. Provision for enrollment in industry schools conducted on university level. Approval by department upon application for trade competency examination and work experience in industry. (1-18F,W,Sp,Su) ®

504. Manufacturing Enterprise. Focuses on management technology used to establish a manufacturing firm, engineer a product and production system, finance the operation, and market the product. Prerequisite: ITE 103. (3F,Sp)

521. Class and Facility Organization and Management. The process, purpose, and results of a well-planned facility and instructional program with emphasis on safety and efficiency. (3Sp)

522. Analysis and Course Development. Principles and practice in analyzing occupations for instructional purposes. Selection and arrangement of instructional materials for industrial education coursework. Prerequisites: admission to teacher education, ScEd 301, and ITE 303. (5F)

523. Technical Training for Innovative Programs. Preparing prospective and incumbent teachers to implement and conduct contemporary programs. Skill development and the philosophy needed to innovate are included. (1-6F,W,Sp,Su) ®

524. Principles of Technology. An introduction to the applied technology principles that form the basis for today's society. (2-5Sp,Su)

550. Technology and Society. A study of the dynamic interaction between technology and society and responsibility of humans in directing changes of our future. (3Sp)

568. Applied Research Project. Development and completion of an approved applied aerospace research project. Prerequisite: ITE 285. Limited to senior students. (1-3F,W,Sp) ®

574. Welding Metallurgy Ferrous. Metallurgy principles are applied to welding and testing steel alloys. Prerequisite: ITE 285. (4F)

575. Welding Metallurgy Nonferrous. Metallurgy principles are applied to welding and testing stainless steels, and alloys of aluminum, titanium, nickel, and copper. Prerequisite: ITE 574. (3W)

576. Weldability of Metals. Applications of weldability and testing of base and filler metals. Prerequisite: ITE 575. (3Sp)

580. Seminar. Prerequisite: senior status. (1-3F,Sp) ®

590. Workshop in Industrial Technology and Education. Special workshops for education or industry. May be repeated, provided content varies. (1-6F,W,Sp) ®

591. Special Problems in Industrial Education. (1-6) ®

592. Related Technical Training in IE. (1-18)

Graduate[2]

609. Curriculum for Technology Education. (3Sp,Su)

610. Issues and Trends in Technology Education. (3Su) ®

620 (d420). Composite Manufacturing Processes. (4W)

625. Internship. (1-12F,W,Sp,Su) ®

630. (d430). Corrosion and Corrosion Control. (3Sp)

640. Cooperative Industrial Programs. (3Su)

645. Organization of Industrial Education Programs. (3W,Su)

651. Administration and Supervision of Technology Education. (3Sp,Su)

656 (d456). Industrial Robots. (3W)

661. Strategies of Instruction. (3F,Su)

663. Welding in Extreme Environments. (3Sp)

664 (d464). Tooling for Automation. (3Sp)

675. Research in Technology Education. (3F,Su)

680. Seminar. (1-2F,W,Sp,Su) ®

682 (d482). Manufacturing Control Systems. (3Sp)

690. Readings and Conference. (1-3F,W,Sp,Su) ®

691. Experimental Laboratory in Technology Education. (1-3F,W,Sp,Su)

693. Independent Study. (1-6F,W,Sp,Su) ®

696. Creative Project. (1-6F,W,Sp,Su)

697. Thesis Research. (3-9F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-3F,W,Sp,Su) ®

723. Foundations of Industrial Education. (3Su)

746. Industrial Education Finance. (3Su)

781. Research Seminar. (1-6F,W,Sp,Su) ®

797. Dissertation Research. (1-15F,W,Sp,Su) ®

799. Continuing Graduate Advisement. (1-3F,W,Sp,Su) ®

[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Department of
Instructional Technology
College of Education

Head: Professor Don C. Smellie
Office in Emma Eccles Jones Education 215, 797-2694

Professors Nick Eastmond, Alan M. Hofmeister[1], M. David Merrill, Ron J. Thorkildsen[2], R. Kent Wood; **Associate Professors** Byron R. Burnham[3], Andrew S. Gibbons, J. Steven Soulier; **Assistant Professor** Linda L. Wolcott; **Research Assistant Professor** Charles Stoddard; **Adjunct Assistant Professor** Gary S. Poppleton[4]; **Adjunct Instructors** Deborah Boutwell[5], Penny Findlay[6], Nathan M. Smith, Jr.[7]; **Research Associates** Leston D. Drake, Catherine A. Elwell, Mark J. Lacy, Jean A. Pratt, T. Clay Stevens

Degrees offered: Master of Education (MEd) and Master of Science (MS) in Instructional Technology; Educational Specialist (EdS) in Instructional Technology; participates in the Interdepartmental Doctorate of Philosophy (PhD) and Doctorate of Education (EdD)

Areas of specialization: Instructional Development for Training and Education, School Information Technology, Educational Technology, Interactive Learning Technologies, School Library Media Teaching Minor, Multimedia Development Minor

[1]Professor of Special Education.

[2]Associate Dean for Research, College of Education.

[3]Staff Development and Evaluation Specialist, University Extension; Associate Dean, Learning Resources.

[4]Director, Independent Study; Director, Marketing and Production Design for Continuing Education.

[5]Library Media Specialist, Edith Bowen Laboratory School.

[6]Media/Videodisc Specialist, Center for Persons with Disabilities.

[7]Associate Director, Educational Resources and Technology Center.

Objectives

Instructional technology includes aspects of instructional design and development, communications, product development, electronic distance education, and library and information technology. Instructional technology is defined as "a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communication, and employing a combination of human and nonhuman resources to bring about more effective instruction." Each aspect of the field has unique contributions to make to the teaching-learning process. Graduates are currently placed in business and industrial settings, as well as education.

The minors in Instructional Technology, along with the MEd, MS, EdS, EdD, and PhD degrees, provide a wide range of preparation enabling individuals to function at several levels of service in education, industry, and business settings. Admission to the master's program is open to all students regardless of the undergraduate area of preparation. For more specific information regarding these programs, write to the department head.

Department Admissions Requirements

Bachelor Degree Minors. There is no major at the undergraduate level in instructional technology because of the need for those preparing in the field to have especially strong liberal and general education. The minors may emphasize School Library Media administration or Multimedia Development. Those persons wishing to certify for positions in the public schools must complete a teaching certificate and the prescribed 27-quarter-credit School Library Media program for the basic media certificate. A 2.7 grade point average is required for admission and certification as an instructional media specialist at

the bachelor's degree level. Persons not seeking a public school position may elect the 21-credit minor in Multimedia Development in conjunction with a major in other fields. The Multimedia Development minor is especially appropriate for fields which require a great deal of computer-based instruction such as business, engineering, natural resources, and others.

Requirements for the Instructional Technology minors are as follows:

School Library Media Teaching Minor. InsT 445, 446 or 447, 500, 502, 503, 506, 507, 539, and 615. Literature for children or adolescents is also required, if not part of the undergraduate program.

Multimedia Development Minor. As this catalog went to press, the requirements for this minor were being revised. For more information, contact the Instructional Technology Department.

Graduate Study

The Department of Instructional Technology has been assigned the exclusive role by the Utah State Board of Regents for all post-master's degree and certificate programs in information, library and instructional sciences, and other terms used to designate the components of the field of Instructional Technology. Because of that exclusive assignment, brief descriptions are given for graduate as well as undergraduate programs. Further information may be obtained from the department and/or the *Graduate Catalog*.

Master Degree Programs. The master degree programs consist of four areas of emphasis: (1) information technology, (2) instructional development for careers in education and industrial training, (3) educational technology, and (4) interactive learning. Those persons wishing to certify as professional media specialists in the public schools must hold or complete a teaching certificate and complete the School Library Media Teaching minor or the Information Technology master's program, along with obtaining departmental recommendations for professional media certification. In some states this certificate is still called a library certificate (but combines the studies of library science and educational communications and technology). Completion of application forms for the Instructional Technology program requires a 3.0 GPA for the last two years of study, three letters of recommendation, a personal letter expressing personal goals in entering the master's degree program in instructional technology, and satisfactory scores on the Miller Analogies Test (43) or a verbal and quantitative score at the 40th percentile on the Graduate Record Examination. Persons preparing for careers as instructional technology professionals, in college, university, business, and other settings outside public education, are not required to hold a teaching certificate, although this background is often helpful.

Those desiring to meet graduation requirements should matriculate in the Department of Instructional Technology and plan to take the requirements for the area of emphasis selected.

Educational Specialist Degree. The Educational Specialist in Interactive Learning Technologies (EdS) is for students interested in acquiring advanced skills in instructional technology beyond those of the master's degree. The program focus is practical and applied rather than theoretical and research-oriented. Students may choose from four areas of emphasis: interactive instructional tool building, advanced interactive multimedia design, adult and distance education, and evaluation. This program involves coursework, independent study, practicum experiences, and a final project. A minimum of 45 credits beyond the master's degree is required. Additional credits are required for students not having a master's degree in the field. Admissions requirements to the EdS programs include the following:

1. Grade point average of 3.00 in last 45 credits of graduate work.
2. Score at the 40th percentile on verbal and quantitative on the Graduate Record Examination or 46 on the Miller Analogies Test.
3. A master's degree.
4. Three letters of recommendation.
5. A personal statement regarding educational/training philosophy as related to the desire to complete the EdS degree.

Doctorate Degree in Instructional Technology. The doctorate offered through the College of Education provides Instructional Technology students with the opportunity of combining the general areas of research and learning theory with the more specific area of Instructional Development.

Instructional Development has been defined as a set of systematic procedures for designing, developing, and validating instructional products and procedures. It is directed at achieving objectives which are based on research in human learning and communication. Application of these procedures may result in the production of systems of learning which arrange human and nonhuman resources most efficiently to bring about effective learning in educational and training settings. Admission requirements to the EdD or PhD, with emphasis in Instructional Technology, are as follows:

1. Grade point average of 3.0 for last two years of academic work.
2. Score of 1,100 on the combined verbal and quantitative Graduate Record Examination. A minimum score at the 40th percentile must be obtained on the verbal and quantitative tests.
3. Master's degree.
4. Three letters of recommendation.
5. Personal statement regarding educational philosophy related to the desire to complete the EdD or PhD degree.

The degree is designed for those planning to enter a training/development career in business, industry, college teaching, or instructional media and technology services, and those coordinating or supervising in school district or state offices.

Instructional Technology Courses

SK 100. Use of Libraries and Learning Resources. Designed to develop the competencies needed for lifelong pursuit of knowledge through the use of libraries, reference services, and information sources. (3F,W,Sp) ©

170. Instructional Technology Programs. An in-service experience for school library media aides/paraprofessionals to improve local programs and services. Topic will vary. (1-3F,W,Sp,Su) ®

445. Principles and Practices of Technology for Teachers. Prepares pre-service teachers to apply a systems approach to design and development of instruction and apply technology both as process and product to learning environments. Concurrent enrollment in either InsT 446 or 447 required. (2F,W,Sp,Su)

446. Technology Practicum for Elementary Teachers. Practical experience in various technologies of instruction using interactive and other technology-based instructional systems. Concurrent enrollment in InsT 445 required. (4F,W,Sp,Su) ®

447. Technology Practicum for Secondary Teachers. Practical experience in various technologies of instruction using interactive and other technology-based instructional systems. Concurrent enrollment in InsT 445 required. (4F,W,Sp,Su) ®

491. Undergraduate Research Creative Opportunity. A cooperative process of discovery, investigation, research, or creativity between faculty and one or more students. (1-3F,W,Sp,Su) ©

***500 (d600).[1] Providing Information Services.** Introduction to the information-providing services of a library media program. Emphasizes reference interviewing, knowledge of basic reference/information sources, and strategies for retrieving information. (3Su)

****502 (d602). Developing Library Media Collections.** Building and maintaining collections for library media programs. Discusses policy development, intellectual freedom, and reviewing, evaluating, and selecting materials in all formats. (3Su) ©

****503 (d603). Reading Guidance.** Scope of reading programs in media centers. Special problems, interests, tools, and case studies relating to work with children and young people. (3Su)

***506 (d606). Organizing and Accessing Information.** Considers concepts, policies, and techniques for facilitating access to information in library media centers. Addresses cataloging and classification, and procedures for acquisition, processing, and management. (3Su)

***507 (d607). Library Media Center Administration.** Includes the study of organization, personnel, budgets, selection, and evaluation of materials and equipment, providing for a wide variety of media services. Prerequisites: InsT 500, 502, 506, and 515. (3Su)

***509 (d609). Information Technology and Automation in Library Media Centers.** Explores systems and functions of information technology in library media centers. Includes applications in collections development, circulation, and technical and reference services. Prerequisites: InsT 500/600 and 506/606. (3Su)

***515 (d615). Library Media Programs in the Information Age.** Introduction to library media programs for teachers, administrators, and media specialists. Examines the role of media programs in instruction and curriculum. (3Su)

516. MacIntosh Applications for Instruction and Training. Introduction to the use of MacIntosh computer applications, with special emphasis on software used in instruction and training for inexperienced users. Prerequisite: computer literacy. (3F,W,Sp,Su)

*****524. Teaching and Computers.** A study of instructional strategies and methods utilized to effectively teach computer literacy in the secondary schools. (3W)

***534 (d634). Instructional Development in Education.** An introductory course for teachers and library media specialists, in which students will implement a systems model for identifying of educational problems, developing solution alternatives, evaluation, and revision cycles. (3Su)

539 (d639). Field Work. Observation and guided practical experience under professional instructional technology personnel. Bridges the gap between classroom theory and practice in the field. Prerequisite: instructor's consent. (1-9F,W,Sp,Su)

***543 (d643). Slide and Multi-image Design and Development.** Theory, planning, design, and production of presentations, involving single and multiple images integrated into an educational learning experience. (3Sp,Su)

****544 (d644). Single Camera Video for Instruction and Training.** Use of single camera video to familiarize students with the properties of the medium to record, edit, and duplicate video programming for education and training applications. (3F,W,Sp,Su)

548 (d648). Presentation and the Technologies of Instruction. Both proven and new technologies of instruction and presentation examined, while perfecting individual and group presentation skills. Emphasis on competent utilization of a variety of technologies of instruction and training. (3Sp,Su)

573. Instructional Technology Workshop. Special training and experience in the latest concepts and innovations in instructional technology. Content changes reflecting the most recent topics and problems facing the profession. (1-5Su)

590. Independent Study. Individually directed study and projects. Departmental permission required before registration. (1-6F,W,Sp,Su) ®

Graduate[2]

***600 (d500). Providing Information Services.** (3Su)

***601. Technology and its Role in the Transformation of Education.** (3Su)

****602 (d502). Developing Library Media Collections.** (3F,Su)

****603 (d503). Reading Guidance.** (3Su)

***606 (d506). Organizing and Accessing Information.** (3Su)

***607 (d507). Library Media Center Administration.** (3Su)

***609 (509). Information Technology and Automation in Library Media Centers.** (3Su)

***615 (d515). Library Media Programs in the Information Age.** (3Su)

****616. Computers in Instructional Technology.** (3F,W,Su)

****617 (f622). Design and Development of Microcomputer-based Instructional Software.** (3F,Su)

618. Instructional Simulations. (3W)

****619. Multimedia Video Graphics.** (3F,Su)

623 (f523). Computers in Education for Inservice Teachers. Taught off campus only. (1-3F,W,Sp,Su) ®

625. Graduate Cooperative Work Experience. (1-15F,W,Sp,Su) ®

627. Computer-assisted Instruction Programming: Authoring Languages. (3W,Su)

628. Advanced Authoring Systems. (3Sp)

629. Algorithm Design for Computer-Based Training. (3Sp)

****634. Instructional Development in Education.** (3Su)

635. Instructional Development. (3F,Su)

***636 (f536). Foundations of Instructional Technology.** (1-3F,W,Sp,Su) ®

637. Multimedia Design and Production. (3W)

****638. Interactive Multimedia Technologies.** (3W,Su)

639 (d539). Field Work. (1-9F,W,Sp,Su)

640. Information Technologies for Foreign Language Teaching. (3F)

***643 (d543). Slide and Multi-image Design and Development.** (3Sp,Su)

****644 (d544). Single Camera Video for Instruction and Training.** (3F,W,Sp,Su)

***645 (f731). Instructional Technology Theory and the Learning Process.** (3F,Su)

646. Principles and Practices of Distance Education. (3Sp)

648 (d548). Presentation and the Technologies of Instruction. (3W,Su)

*****656. Practicum in the Improvement of Instruction.** (1-6) ®

***661 (f561). Instructional Technology Communication Theory.** (3Sp,Su)

***662. Instructional Technology Communication Theory for International Students.** (1Sp,Su)

*****670. Instructional Technology Programs.** (1-3) ®

*****672 (f570). Instructional Technology in Education and Training.** (3) ®

*****673 (f571). Instructional Technology Workshop.** (1-5Su) ®

676. Instructional Project Management. (3Sp)

677 (f735). Instructional Design. (3W)

****678. Instructional Product Development.** (3Sp,Su)

****679. Instructional Product Evaluation.** (3W)

****680. Implementation and Management of Instruction and Training.** (3Sp,Su)

681. Research Seminar. (1F,W,Sp,Su) ®

682. CDL: Analysis, Design, and Production. (3-9F,W,Sp,Su) ®

690. Independent Study. (1-9F,W,Sp,Su) ®

691. Independent Research. (1-6F,W,Sp,Su) ®

694. Internship. (3-9F,W,Sp,Su) ®

695. Externship. (3-9F,W,Sp,Su) ®

696. Creative Project. (3-9F,W,Sp,Su) ®

697. Thesis. (1-9F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-12F,W,Sp,Su)

705. Internship in Program Evaluation. (1-6) ®

706. Internship in Research. (1-6) ®

738. Current Issues Seminar. (3F,W,Sp,Su) ®

744. Instructional Technology Research and Development. (3Sp)

781. Research Seminar. (1F,W,Sp,Su) ®

782. Instructional Research Review Practicum. (3-9F,W,Sp,Su) ®

783. Instructional Product Development Practicum. (3-9F,W,Sp,Su) ®

784. Instructional Empirical Investigation Practicum. (3-9F,W,Sp,Su) ®

785. Instructional Evaluation Practicum. (3-9F,W,Sp,Su) ®

786. Funding Proposal Practicum. (3-9F,W,Sp,Su) ®

790. Independent Study. (1-5F,W,Sp,Su) ®

791. Independent Research. (1-3F,W,Sp,Su) ®

792. College Teaching Seminar. (1-3F) ®

796. Practicum. (1-12F,W,Sp,Su) ®

797. Dissertation. Individual work on research problems in the EdD program. (1-18F,W,Sp,Su) ®

799. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing; parenthetical numbers preceded by an *f* are the *former* course numbers.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

*Summers of 1996 and 1998.

**Summer of 1997.

***Taught on demand.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

Intensive English Language Institute

College of Humanities, Arts and Social Sciences

Director: Principal Lecturer Franklin I. Bacheller
Office in Main 202, 797-2081

Assistant Director: Principal Lecturer Lee Ann Rawley
Office in Main 202, 797-1216

Principal Lecturers James E. Bame, Susan Carkin, Glenda R. Cole, Jim Rogers; **Senior Lecturers** Barbara W. Buchanan, Thomas J. Schroeder; **Temporary Lecturers** Jerry Call, Connie M. Mecham, Cathy Young

Objectives

The Intensive English Language Institute (IELI) is an academic program in the College of Humanities, Arts and Social Sciences. It is designed to help international students attain the English language proficiency necessary for university study. Undergraduate students who apply to USU without a TOEFL score of 500 and graduate students without a 550 TOEFL score must take the IELI Placement Exam given the first day of each quarter (January, March, June, and September). Based on the exam results, students will be recommended for study in the IELI or exempted from further study and permitted to enter the University.

Curriculum

Four levels of study in IELI are offered each quarter, elementary through advanced. Students take classes in Communication, Listening, Reading, Writing, Conversation, and American Culture. Upon successful completion of the advanced level (4), students are permitted to register for full-time university classes. Graduate students enrolled in the advanced level may take university classes in addition to their IELI classes with permission

of their advisers. Students at any level may audit university classes, with permission from the classroom instructor and by paying the appropriate fee. The university classes cannot conflict with the schedule of the IELI classes.

Credit for Intensive English Study. Classes in IELI carry academic credit. There are five classes for each level, each class carrying four credits. Full-time students at each level receive 20 hours of university elective credit at the 100- and 200-levels, and are in class 20 to 25 hours a week. A student who begins IELI in Level 1 and progresses to Level 4 may earn a total of 80 undergraduate elective credits. While all the credits appear on the student's transcript, a maximum of 25 can be counted toward graduation. The number and kind of elective credits accepted for graduation vary by department; students must therefore meet with their departmental advisers to determine the role of IELI credits in their graduation requirements.

Services

New students in IELI take the Placement Examination and attend an orientation meeting prior to the beginning of each quarter. All students are assigned an adviser in IELI who helps them with problems they may encounter on campus and in Logan. In addition, IELI students are entitled to all the services and privileges offered to USU students on campus, including health care services, recreational opportunities, and numerous special programs for international students.

Intensive English Language Institute Courses

111. Intensive English Language Institute Reading 1. Helps students begin developing strategies for reading academic material and other material they encounter outside the classroom. (4F,W,Sp,Su)

112. Intensive English Language Institute Composition 1. Basic English sentence structure and mechanics of descriptive and chronological paragraph development. (4F,W,Sp,Su)

113. Intensive English Language Institute Communication 1. Integrates listening, speaking, reading, and writing with an emphasis on communication. (4F,W,Sp,Su)

114. Strategies for Comprehending Spoken English I (Beginning). Introduces strategies for understanding spoken English from a variety of sources. Focus on identifying key words and phrases to understand general ideas, and on receiving clarification. (4F,W,Sp,Su)

115. Intensive English Language Institute Language Lab 1. Provides international students with orientation activities and language skills which begin to integrate them into university and community life. (4F,W,Sp,Su)

151. Intensive English Language Institute Reading 2. A low-intermediate reading course designed to introduce students to predicting, reading for main and supporting ideas, distinguishing between fact and opinion, and skimming for general ideas. Content is relevant to daily life in Logan and the USA. (4F,W,Sp,Su)

152. Intensive English Language Institute Composition 2. Development of syntactic fluency in writing sentences, paragraphs, and short essays. (4F,W,Sp,Su)

153. Intensive English Language Institute Communication 2. Designed to develop speaking and listening skills necessary for social and academic interaction. Emphasis on appropriate responses to varying cultural situations; discrete skills involved in listening and pronunciation. (4F,W,Sp,Su)

154. Strategies for Comprehending Spoken English II (Intermediate). Helps students develop conversational listening skills. Academic listening skills also introduced. (4F,W,Sp,Su)

155. Intensive English Language Institute Conversation 2. Oral communication class emphasizing interactional speaking and listening with attention to nonverbal behaviors which influence the communication process. Small discussion groups with American students. (4F,W,Sp,Su)

201. Intensive English Language Institute Reading 3. Introduces the reading of authentic texts. Focus on strategies such as recognizing main ideas and transitional devices, identifying antecedents, making inferences, and separating fact from opinion. (4F,W,Sp,Su)

202. Intensive English Language Institute Composition 3. Students develop sentences and compositions using formal definitions, classifications, expressions of purpose, comparatives, and connectives. (4F,W,Sp,Su)

203. Intensive English Language Institute Communication 3. High-intermediate level class emphasizing the development of oral skills, both communicative and grammatical, needed for academic and social functions. (4F,W,Sp,Su)

204. Strategies for Comprehending English in Authentic Oral Text. Helps students develop strategies for understanding authentic listening material encountered outside the classroom, while focusing on academic and critical thinking skills. (4F,W,Sp,Su)

205. Intensive English Language Institute Conversation 3. Oral communication class emphasizing comprehensibility, expressions of opinion, agreement and disagreement, and summarizing spoken information. Small discussion groups with American students. (4F,W,Sp,Su)

251. Intensive English Language Institute Reading 4. Advanced reading strategies designed to prepare students to read university materials. Emphasizes improvement of reading speed and comprehension, as well as word formation, vocabulary development, context clues, and transitions. (4F,W,Sp,Su)

252. Intensive English Language Institute Composition 4. Focuses on the development of thesis statements, and paragraphs leading to effective compositions and essays. (4F,W,Sp,Su)

253. Academic Discourse for Nonnative Speakers of English. Focuses on the English needed to gather and synthesize academic information, then present it orally in formal and informal classroom situations using appropriate grammatical structures and presentation style. (4F,W,Sp,Su)

254. Strategies for Comprehending Spoken Academic English. Helps students develop strategies for understanding English encountered in the university classroom. Focuses on listening to lectures and following class discussions. (4F,W,Sp,Su)

256. Cross-cultural Perspectives of American Culture. A cross-cultural perspective on the American value system and institutions. (4F,W,Sp,Su)

299. Individual Study. Limited to international students. Instructor's permission required. (1-5F,W,Sp,Su)

Graduate

792. College Teaching Seminar. A workshop designed for international students who will hold teaching assistantships at the University. Students must take a qualifying language test to be accepted into the workshop. (1-3F,W) ®

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Department of

Landscape Architecture and Environmental Planning

College of Humanities, Arts and Social Sciences

Head: Professor Richard E. Toth
Office in Fine Arts Visual 230, 797-0500

Professors Jerry W. Fuhriman, Craig W. Johnson; **Associate Professors** Vern J. Budge, John C. Ellsworth, John K. Nicholson, Michael L. Timmons; **Assistant Professors** David L. Bell, Caroline Lavoie; **Adjunct Faculty** Dale J. Blahna (Associate Professor, Forest Resources), Mark W. Brunson (Assistant Professor, Forest Resources), Robert H. Schmidt (Assistant Professor, Fisheries and Wildlife)

Degrees offered: Bachelor of Landscape Architecture (BLA)[1] and Master of Landscape Architecture (MLA)[1] in Landscape Architecture; Master of Science (MS) in Town and Regional Planning

Objectives

The objectives of the department are to (1) provide an educational and technical program that is responsive to current needs and demands for the resolution of problems related to environmental planning and design, (2) maintain a balance in the student's professional education so that he or she may be made fully aware of future professional opportunities in the broadest sense and not just one oriented to technical service, (3) continue the development of the program within the context of interdisciplinary coordination with the Colleges of Natural Resources, Engineering, Agriculture, and Humanities, Arts and Social Sciences, and (4) research, develop, and test new theories, methods, and tools needed to assist landscape architects in a clearer and deeper understanding of man's relationship to the environment.

Admission and Graduation Requirements

The requirements for admission and graduation are commensurate with those established in the first part of this catalog, titled Graduation Requirements. The only additions to the University requirements which the department maintains is with regard to matriculation into the upper-division (junior and senior years) and the certificate program in Liberal Arts and Sciences.

Students must attain sophomore status in the department prior to applying for permission to continue on in upper-division courses.

Courses required for matriculation into upper division are: LAEP 120, 135, 136, 220, 230, 231, 260, 265, 270, 271, 272; PlSc 261; ITE 121; and LAS 125. Students must complete Math 106 before registering for LAEP 361.

In the spring of their sophomore year, Landscape Architecture students in the BLA program are ranked by grade point average in all University classes. Students considered for matriculation into the junior year must have a University GPA of 2.5 or higher. These students will then be ranked according to their grade point average, and the top twenty-five students will be matriculated into the junior year. The primary reasons for this evaluation are: (1) to maintain a high quality educational experience for the student in upper division, and (2) to establish a reasonable faculty/student ratio to maintain the status of full accreditation by the American Society of Landscape Architects. Those students who are not allowed to take upper-division courses may return the following year and retake courses to improve their GPA and be considered again for the upper division.

After students are admitted into the upper division, their academic requirements are commensurate with those set out by the University *Undergraduate Catalog*. The only exceptions to this are the department's requirement for 9 credits of written communication and the completion of the certificate program in Liberal Arts and Sciences.

High school students planning to major in landscape architecture and environmental planning may obtain the necessary background with courses in art, natural sciences, social sciences, and math through trigonometry.

BLA Degree. The Bachelor of Landscape Architecture (BLA) degree is a four-year program consisting of courses relating to theory, design, history, and the various technical areas of the profession. This degree is fully accredited by the American Society of Landscape Architects. The degree provides a substantial basis for a professional career as well as an excellent foundation for advanced graduate studies. In addition to the courses required for sophomore status, the following LAEP courses are required for the junior and senior year: LAEP 310, 311, 312, 350, 361, 362, 370, 410, 411, 412, and 495. Students will also complete the Learning Skills requirements, American Institutions requirement, and the Liberal Arts and Sciences Area Studies Certificate. For more detailed information on requirements, see major requirement sheet available from the department.

Liberal Arts and Sciences Area Studies Certificate. The LAEP Department requires that entering freshmen complete the Certificate Program in the Liberal Arts and Sciences. Additionally, transfer students (four-year program) with less than 45 credits earned are also required to complete the LAS Certificate Program.

The Liberal Arts and Sciences Program offers a broad and challenging course of study in the humanities, sciences, arts, and social sciences. Through a multidisciplinary but coherent approach to learning, the program meets the needs both of students majoring in professional fields and those desiring a general background for

[1]Fully accredited by the American Society of Landscape Architects.

any employment. By directly engaging in different modes of inquiry, the Liberal Arts and Sciences student develops the desire and capacity for independent thought, self-integration, self-discovery, and lifelong learning.

For more information, students should contact their adviser or an LASP adviser in the Science/HASS Advising Center, Student Center 304.

Specialized Service Courses. LAEP 103, 120, 135, 230, 231, and 370 are available for majors in other fields who may wish to gain an exposure to the different aspects of landscape architecture and environmental planning. A minor is not given in LAEP; however, these service courses are available, without prerequisites, for those requesting them.

Graduate Study

The Department of Landscape Architecture and Environmental Planning offers two graduate degrees: Master of Landscape Architecture (MLA), which is fully accredited by the American Society of Landscape Architects, and Master of Science in Town and Regional Planning. See the *Graduate Catalog* for further information.

Landscape Architecture and Environmental Planning Courses

HU 103. Introduction to Landscape Architecture. Environment as a basis for land use and design decisions. Topics discussed include environmental awareness, the planning process, and design related to home, community, and the region. Three one-hour lectures per week. (3F,W,Sp) ©

120. Basic Graphics. Graphic techniques for landscape architectural drawings including plans, elevations, isometrics, perspective, rendering, and model construction. Two three-hour studios per week. (4F,W)

135. Theory of Design. Basic elements of design with emphasis upon their relationship to landscape architecture. Form and spatial relationships are stressed through student development of two- and three-dimensional design models. Two three-hour studios per week. (4W)

136. Applied Theory of Design in Landscape Architecture. Design theory applied to the materials of landform, vegetation, water, and architecture. Two three-hour studios per week. Prerequisite: LAEP 135. (4Sp)

220. Graphics. Emphasis upon techniques and approaches to freehand sketching and rendering. Various media will be explored for preparing drawings and sketches for presentation. Two three-hour studios per week. Prerequisite: LAEP 120. (4W)

225. Internship and Cooperative Education Program. Course credit for professional experience outside the classroom prior to graduation. A statement of professional goals and a summary report following the experience are required. (1-5) ®

230. History of Landscape Architecture. Physical planning as it relates to human experience from prehistory through the Renaissance. Emphasis placed on human dynamics and the application of historic thought to current and future design. Three one-hour lectures per week. (3F)

231. History of Landscape Architecture. Exposure to the history of the profession as it developed from medieval England to current day planning practices. Three one-hour lectures per week. (3W)

260. Landscape Construction. An introduction to site engineering, grading, cut and fill calculation, layout and dimensioning, and an introduction to roadway alignment. Two three-hour studios per week. Prerequisite: LAEP 120. (4F)

265. Architectural Design. The exploration of architectural form and structure in exterior environments. The emphasis will be placed on space created by architectural forms and their relationship to the surrounding environment. Two three-hour studios per week. Prerequisite: LAEP 136. (4Sp)

270. Site Analysis Methods. Includes site survey, analysis, and design synthesis. Student teams survey and analyze a site's landscape and cultural resources. Three three-hour studios per week. Prerequisite: LAEP 136. (5F)

271. Function and Structure of Built Environments. Focuses on human behavior as a design consideration as expressed in land uses; circulation; use relationships; and physical form. Three three-hour studios per week. Prerequisite: LAEP 270. (5W)

272. Site Planning and Design. Synthesizes the subject matter covered in LAEP 270 and 271. Investigates the problem solving processes in various disciplines and relates them to the profession of landscape architecture. Three three-hour studios per week. Prerequisite: LAEP 271. (5Sp)

310. Recreational Landscape Design. Focuses on recreation project scale design. Includes design seminars and guest lectures. Three three-hour studios per week. Prerequisite: LAEP 272. (5F)

311. Institutional and Community Design. Focuses on large-scale residential projects, planned unit developments, and community facilities such as schools, colleges, or government complexes. Prerequisite: LAEP 310. (5W)

312. Construction Document Preparation. A continuation of an LAEP 311 design project through detail design development and completion of the working drawings and specifications. Three three-hour studios per week. Prerequisite: LAEP 311. (5Sp)

320. Graphics. Explores a variety of graphic techniques as a means of problem solving and design presentation. Two three-hour studios per week. Prerequisite: LAEP 220 or instructor's permission. (3Sp)

350. Planting Design. The exposure to specific aspects of planting design including climate control, circulation definition, screening, and aesthetic considerations. Two three-hour studios per week. Prerequisites: PlSc 261 and LAEP 272; or instructor's permission. (4F)

361. Landscape Construction. An introduction to construction materials, wood construction, retaining walls, pavements, drainage, and utility systems. Individual reports on construction materials. Two three-hour studios per week. Prerequisites: LAEP 260 and Math 106. (4W)

362. Landscape Construction. Aesthetic, technical, and theory of roadway alignment. Vertical/horizontal curves, stationing, and grading. Introduction to the theory and design of sprinkler irrigation. Two three-hour studios per week. Prerequisite: LAEP 361. (4Sp)

370. City and Regional Planning. An introduction to the procedures and methods of city and regional planning. Legislative, administrative, and effectuation of the general comprehensive plan. Three one-hour lectures per week. (3W)

400. Future Environments. Capstone studio in the LAS Cluster: Future Environments. Within a "studio" environment, students will integrate and apply material from the first four units. (4)

410. Computer Applications in Landscape Architecture. Emphasizes the major analytical and technical components of large-scale resource planning and design. Computer techniques are used in the studio. Two three-hour studios per week. Prerequisite: LAEP 312 or instructor's permission. (5F)

411. Project Design. An in-depth study of proposed site design projects from proposal preparation to final design recommendations. Three three-hour studios per week. Prerequisite: LAEP 410. (5W)

412. Emerging Areas in Landscape Architecture. An exploration of new and emerging areas in the profession of landscape architecture such as land reclamation

and visual resource management. Three three-hour studios per week. Prerequisite: LAEP 410. (5Sp)

425. Internship and Cooperative Education Program. Course credit for professional experience outside the classroom prior to graduation. A statement of professional goals and a summary report following the experience are required. (1-5) ®

435. Travel Course. A major field trip to examine a variety of projects in planning and design. Should be taken between winter and spring quarters. (1-3) ®

490. Special Problems. Hours arranged. Selected problems to meet individual needs in completing the professional training. Registration by permission only. (1-6) ®

492. Professional Practicum. Offers students an opportunity to study areas of practical professional interest. (1-2F,W,Sp) ®

495. Seminar. Readings and reports on current topics and trends in professional practice. Also covers contracts, specifications, professional ethics, and office practice. One two-hour lecture per week. (2F)

Graduate[2]

610. Regional Planning Theory and Inventories. (5F)

611. Regional Planning Analysis. (5W)

612. Regional Planning Policy and Implementation. (5Sp)

616. Professional Practice. (2F)

625. Internship and Cooperative Education Program. (1-5) ®

674. Planning Methods. (3F)

675. Implementation and Regulatory Techniques in Planning. (3W)

686, 687, 688. Seminar. (1F) (1W) (1Sp)

690. Special Problems. (1-6) ®

691. Readings in Landscape Perception. (1F)

692. Readings in Creativity and Design Process. (1W)

693. Readings in Landscape Design and the Context of Culture. (1Sp)

697. Thesis Research. (1-10) ®

699. Continuing Graduate Advisement. (1-3) ®

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[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

Department of

Languages and Philosophy

College of Humanities, Arts and Social Sciences

Head: Professor Kent E. Robson
Office in Main 204, 797-1209

Professors Lynn R. Eliason, Charles W. Johnson, John E. Lackstrom, Hans K. Mussler, Richard Sherlock, Alfred N. Smith, Jr.; **Adjunct Professor** Nick Eastmond; **Professor Emeritus** L. Grant Reese; **Associate Professors** M. Isela Chiu-Olivares, Mark L. Damen, Lynne H. Goodhart, Ilona Jappinen, Harold J. Kinzer, Mark D. Larsen, Norman R. Savoie, Gordon R. Steinhoff, Janet C. Stock, Frances Titchener; **Associate Professors Emeritus** Jerry L. Benbow, John M. Beyers, Gordon E. Porter; **Assistant Professors** Charles D. Huenemann, Taira Koybaeva, Renate Posthofen, John S. Seiter, Fuencisla Zomeno; **Assistant Professor Emeritus** Valentine Suprunowicz; **Instructors** Nancy R. Birch, Shelley C. Blakeley; **Principal Lecturer** Viva L. Lynn; **Lecturers** Kevin L. Krogh, Atsuko Neely

Degrees offered: Bachelor of Arts (BA) in French; BA in German; BA in Spanish; BA and Bachelor of Science (BS) in Philosophy

Objectives

The department offers a program in philosophy which leads to the Bachelor of Arts degree or which can substantially support undergraduate or graduate programs in other fields. Philosophy is, for example, an excellent prelaw major.

The Bachelor of Arts degree is also offered in French, German, and Spanish and is designed to prepare students for admission to advanced degree programs in languages, for secondary school teaching certification, or for business and government careers in the USA or abroad. Skill classes beyond the two-year program are available in Russian and Portuguese. In the modern languages, emphasis is placed equally on the four basic language skills: speaking, listening, reading, and writing. The language laboratory permits the student to do as much individual work in speaking and listening as desired.

Other special language offerings include courses in general linguistics and two-year programs in Italian, Japanese, Mandarin Chinese, Latin, Korean, Arabic, Hindi, and Urdu combining self-study with tutorial assistance. Latin, Japanese, and Korean courses extend beyond the two-year program.

A speech minor is offered for those seeking to improve communication skills needed for admission to graduate or professional schools. The speech teaching minor qualifies one to teach high school speech. Speech courses also supplement other offerings of the University.

The department also offers an organizational (corporate) communication minor, which can enhance the career preparation of students in a variety of majors.

Requirements for Language Major

Departmental Admission Requirements. Admission requirements for freshmen and philosophy majors are the same as those described for the University on pages 8-11. Foreign language transfer students from other institutions and from other USU majors need a 2.5 GPA in order to qualify for admission. Students in good standing may apply for admission to the department.

Candidacy. To become a candidate for a major in a language, the student must have completed two years of lower-division work, or the equivalent, in the language. Equivalent preparation acquired through high school study or foreign residence will be determined by the successful completion of an upper-division course in the language.

Major requirements include 40 upper-division credits in the selected language, plus Linguistics 340. Majors also wishing a secondary teaching credential must include French 304, 305, and 501; German 304, 305, 501, and 503; or Spanish 304, 305, 401, and 402; plus Linguistics 350. A 2.50 GPA in major courses is required for graduation.

All foreign language majors must complete nine credits of Written Communication (English Composition). Required courses are English 101 (3 credits), English 200 or 201 (3 credits) and English 301 (3 credits). Philosophy majors must complete six English credits at the 100 and 200 levels.

Candidates for a secondary teaching credential should take Linguistics 340 and French 501, German 501, or Spanish 401 before the end of their junior year and prior to taking Linguistics 350. They must also complete the other professional education courses required for certification (see College of Education for requirements).

An application for admission to teacher education should ordinarily be completed before the junior year (see College of Education). Approval is a prerequisite to teacher certification candidacy and to enrollment in education and psychology courses.

Teaching Minor. For a teaching minor in a foreign language, a student must complete 24 credits of approved upper-division work in one language, including advanced grammar and applied linguistics. Linguistics 350 is required and may be counted as part of the 24 credits.

Students desiring a minor other than a teaching minor in a foreign language must complete ten credits of intermediate and eight credits of upper-division work in the language.

Japanese Minor (25 credits). As of fall 1996, matriculated students must complete 25 credits selected from the following courses: Japn 201, 202, 203, 301, 302, 303. Credit for 100-level courses cannot be applied to requirements for a minor. As this catalog went to press, requirements for the Japanese minor were being revised. For current requirements and additional courses, contact the Languages and Philosophy Department.

Proficiency Tests and Placement in Language Courses. Students who have completed one or more years of language study in high school must take proficiency tests to determine their proper placement in USU's language courses.

Credit by Special Examination. Where basic skills in a language have been acquired by means other than college courses, up to 25 lower-division credits with a letter grade may be earned by completion of a course in that language at a higher level than the credits to be acquired. This must be approved by the

Department of Languages and Philosophy, Main 204. The grade in that course must be *B* or better.

Where basic skills are in a language not offered at USU, up to 25 lower-division credits may be earned by special examination (see Department of Languages and Philosophy). Whenever possible the department will help students make arrangements to take examinations for credit in languages not taught at USU.

All credit received by special examination is listed on transcripts as *P* (pass) grade.

Language Laboratory. Laboratory practice sessions are required for all lower-division language classes and for some upper-division classes; three half-hour sessions are the minimum requirement in all lower-division classes; a fee is charged for this service. Equipment includes computers, a CD ROM player, televisions, and audio equipment.

Summer Quarter in Spain

USU offers qualified students the opportunity to spend summer quarter in Spain. Though particularly designed for students interested in Spanish, sociology-anthropology, fine arts, political science, international relations, or history, a student in any field at USU can qualify by being in good academic standing.

Summer Quarter Programs in Germany and France

USU offers summer quarter programs in Germany and France. These programs are for students with some background in German and French.

Soviet Union Tour

The department also conducts an annual travel-study tour to the Soviet Union. Interested students are invited to join this tour.

Philosophy

Philosophy Major requirements include the following:

A. Forty-five credits in philosophy courses selected in consultation with adviser and acceptable to department.

B. Two years of a foreign language or its equivalent.

A BA in philosophy may be earned if the student completes 45 credit hours and two years of a foreign language. Under some circumstances, a BS in philosophy may be earned if the student completes 45 credits in philosophy courses, especially if the student is a transfer student or is completing a double major.

Speech Communication Minors

Organizational Communication Minor (18 credits). Designed to develop communication skills required for employment in business, government, law, and other careers, this minor may be elected by students in any major. For current requirements, contact the department.

Speech Teaching Minor (27 credits). To become a high school speech teacher, students must complete the speech teaching minor, a teaching major in another field, and the professional education requirements. For current requirements, contact the department or see the University publication, *Guide to the Undergraduate Programs in Secondary Education at USU.*

Arabic Courses

SK 101, 102, 103. Elementary Arabic. Introduction to reading, writing, speaking, and listening with exposure to cultures and customs. Native speaker instructor. Arabic 101 is a prerequisite to 102; Arabic 102 is a prerequisite to 103. (5) (5) (5)

201, 202. Intermediate Arabic. A second-year overview of reading, writing, speaking, and listening with exposure to cultures and customs. Native speaker instructor. (5) (5)

Mandarin Chinese Courses

SK 101, 102, 103. Elementary Mandarin Chinese. Communicative competencies in the four language skills: speaking, listening, reading, and writing with exposure to cultures and customs. Native speaker instructor. Chinese 101 is a prerequisite to 102; Chinese 102 is a prerequisite to 103. (5F,W,Sp) (5F,W,Sp) (5F,W,Sp)

201, 202. Intermediate Mandarin Chinese. A second-year overview of speaking, listening, reading, and writing with exposure to cultures and customs. Native speaker instructor. (5F,W,Sp) (5F,W,Sp)

French Courses

SK 101. Elementary French. First Quarter. Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Not open to those with more than one year high school French or equivalent. (5F,W,Sp) ©

102. Elementary French. Second Quarter. Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Open to students having had French 101 or at least one, but not more than two, years of French in high school. (5F,W,Sp) ©

103. Elementary French. Third Quarter. Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Open to students having completed French 102. (5F,W,Sp) ©

201, 202, 203. Intermediate French. Prerequisite: French 103 or at least two, but not more than three, years of French in high school. (4F,W,Sp) (3F,W,Sp) (3F,W,Sp) ©

297. Intermediate French Language. Designed to be offered only through USU's study program in France, this intermediate course will cover French conversation, grammar, writing, and listening skills. (1-5Su)

298. Intermediate Reading. Designed to be offered only through USU's study program in France, this intermediate course will emphasize reading and discussion of readings in French. (1-5Su)

299. Individual Reading. Individual study of selected readings in French. Instructor's permission required. (1-5F,W,Sp) ®

****300. Introduction to French Literature.** An analytical study of major genres represented in French literature: poetry, prose, drama. The selections studied are chosen from the major periods of French literature. (5F)

304. Advanced French Grammar. A thorough review of French grammar from the more simple to the more complex forms. (3F)

305. Advanced French Composition. A thorough review of French syntax designed to help the advanced student master the complexities of written French. (3W)

306. French Conversation. A course in free conversation which will develop communicative competence in advanced French students. (2F)

307. French Conversation. Conversation becomes the vehicle to develop richness of expression, to increase vocabulary, to learn to express and justify facts, opinions, ideas, and emotions in French. (2)

****320. France Today.** A study of contemporary life in France: The French people, their daily habits, their surroundings. What makes the French French. Extensive use of videos, films, and slides. (No prerequisites, taught in English.) (3Sp)

330. Business French. Study of vocabulary, idioms, and expressions used in French business communications and an introduction to French business practices. Prerequisite: two years of French. (3)

381. Special Topics in French. Introduction to upper-division topics in contemporary literature, culture, and language as determined by student need. Occasionally taught in English. Open to majors and nonmajors. (3F,W,Sp,Su) ®

397. Third Year French Language. Designed to be offered only through USU's study program in France, this course covers French grammar, contemporary language (standard, slang, and business), phonetics, and conversation. (1-5Su)

398. Topics in French Culture or Literature. Designed to be offered only through USU's study program in France, this course covers literature on the third-year level, or aspects of French culture, including art history. (1-5Su)

461. Survey of French Literature: Part I. An overview of French literary movements and transitions from the beginning to 1800. All genres are studied and differences between them are examined thoroughly. (5W)

462. Survey of French Literature: Part II. An overview of French literary movements and transitions in the nineteenth and twentieth centuries. All genres are studied and differences between them are examined thoroughly. (5Sp)

497. Seminar in French Language. Designed to be offered only through USU's study program in France, this course covers advanced grammar, translation, and special projects relating to French language on the fourth-year level. (1-5Su) ®

498. La France Contemporaine. Designed to be offered only through USU's study program in France, this course covers contemporary France, its social, economic, and political history. (1-5Su)

499. Seminar in French Literature. Designed to be offered only through USU's study program in France, this course covers modern French literature on an advanced level. (1-5Su) ®

501. Applied Linguistics and Phonetics. Phonological, morphological, and syntactical problems in learning French. (5W)

515. Information Technologies in the French-speaking World. Practices, theoretical issues, and policy concerns of information technologies resulting from microcomputers, networking, and videodisk. Use of microcomputer with French programs. (Taught in French). (3F)

581. Seminar in French Literature. Course will be determined by student need and interest. Used at least once a year for literature in translation. Open to majors and nonmajors. (3) ®

599. Readings and Conference. Readings in scientific, technical, or literary French. Instructor's permission required. (1-5F,W,Sp) ®

German Courses

SK 101. Elementary German. First Quarter. Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs and using the latest methodologies and technologies. Not open to students having had more than one year of German in high school or the equivalent. (5F,W,Sp)

102. Elementary German. Second Quarter. Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs and using the latest methodologies and technologies. Open to students having had German 101 or at least one but not more than two years of German in high school. (5F,W,Sp)

103. Elementary German. Third Quarter. Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs and using the latest methodologies and technologies. Open to students having completed German 102. (5F,W,Sp)

201. Intermediate German. First Quarter. Further development of first-year skills and competencies. Emphasis on language structure, as well as vocabulary expansion, reading, and writing in the context of culture. (3F)

202. Intermediate German. Second Quarter. Further development of first-year skills and competencies. Emphasis on language structure, as well as vocabulary expansion, reading, and writing in the context of culture. (3W)

210. Intermediate German Conversation. Further development of first-year listening and speaking skills in cultural contexts. Can be taken concurrently with other second-year classes. (2F)

211. Intermediate German Conversation. Continuation of German 210. Further development of listening and speaking skills in cultural contexts. Can be taken concurrently with other second-year classes. German 210 is not a prerequisite. (2W)

212. Intermediate German Conversation. Continuation of German 210 and 211. Further development of listening and speaking skills in cultural contexts. Can be taken concurrently with other second-year classes. German 210 and 211 are not prerequisites. (2Sp)

299. Individual Reading. Individual study of selected readings in German. Instructor's permission required. (1-5F,W,Sp) ®

301. Contemporary German. Reading and discussion of contemporary popular, literary, and scientific materials for students who would like to increase their fluency in German. (2Sp)

***302. Techniques in Translating German Texts.** Familiarization with approaches to translation, special grammatical structures, specialized vocabulary, and reference materials and aids. Practical exercises. (3Sp)

304, 305. Advanced Grammar, Conversation, and Composition. Detailed presentation of German grammar, class discussions, and work on oral and written assignments. (3F) (3W)

****310. Readings in the German Novelle.** In this course students will read and discuss selected German novellen. Brief consideration will be given to the theory and history of the novella. (2F)

****311. Readings in the German Drama.** This course is the second in a three-quarter sequence of introductory literature courses. Students will read and discuss selected German dramas. (2W)

****312. Readings in German Poetry.** This course is the third in a three-quarter sequence of introductory literature courses. Reading and discussion of German poems, selected from various literary periods. (2Sp)

***365. Nobel Prize Winners in German Literature.** Readings in the books of German Nobel Prize winners in literature. (2W)

399. Individual Study. Individual study of selected readings in German. (1-5F,W,Sp) ®

412. The Modern German Short Story. In this course students will read and discuss representative German short stories by twentieth-century writers. (3F)

****420. Germanic Cultures.** Sociopolitical, historical, economic, literary, and cultural trends in German-speaking countries. (3F)

****461. Survey of German Literature.** General view of literary periods, movements, and cultural background with representative readings of major writers. (3W)

****462. Survey of German Literature.** This course is the second in a two-quarter sequence of survey courses designed to give the student an overview of German literature. (3Sp)

****501. Applied Linguistics.** Discussion of syntactical and morphological problems of German; theory of language; psychology of language learning. (3W)

****503. Phonetics.** Analysis of phonological and phonetic patterns of German. (2W)

***540. Lessing: Works and Biography.** Criticism and dramatic works of Lessing; study of his biography. (3W)

***541. Schiller: Works and Biography.** Poems and dramatic works of Schiller; study of his biography. (3Sp)

***543. Goethe: Works and Biography.** Goethe's works and special emphasis on his lyric contributions; his biography. (3F)

***561. Goethe's Faust.** Development of Faust legend; Goethe's treatment of the theme in Urfaust; reading and discussion of Faust I. (2F)

***589. Problems in German Literature.** Senior seminar on selected critical topics in German literature. (3Sp) ®

599. Readings and Conference. Readings in technical, scientific, and literary German. Instructor's permission required. (1-5F,W,Sp) ®

Greek Courses

SK 101. Beginning Greek. Students will learn beginning Ancient Greek grammar, syntax, and vocabulary. Emphasis is on memorization, formation, and identification of Greek words. (5F)

102. Intermediate Greek. Students will build on their basic knowledge and learn to manipulate more advanced grammatical constructions. Emphasis is on synthesizing knowledge and learning to deduce and predict forms rather than memorize. Prerequisite: permission of instructor. (5W)

103. Advanced Greek. Students will use their grammatical and inductive skills to translate an unabridged Greek work. Emphasis is on translation skills. Prerequisite: permission of instructor. (5Sp)

110. Beginning Koine Greek. Basic concepts of Koine Greek, including the alphabet and Hellenistic pronunciation. Basic grammar. (5F)

111. Intermediate Koine Greek. Continution of Grk 110. Students will be introduced to complexities of the Koine tense and aspect system through work with the Aorist and Perfect. Prerequisite: Grk 110. (5W)

112. Advanced Koine Greek. More advanced topics of morphology and syntax. Beginning graduated readings in Koine texts. Emphasis on vocabulary building. Prerequisites: Grk 110 and 111. (5Sp)

310. Ancient Greek Prose: Readings in Plato, Xenophon, Herodotus, and Plutarch. Readings in the Greek prose authors: Xenophon *(Anabasis, Cyropaedia, Memorabilia)*, Plato *(Republic, Symposium, Ion)*, Herodotus *(Histories)* and/or Plutarch *(Lives)*. Prerequisite: permission of instructor. (3F)

311. Ancient Greek Poetry: Readings in Homer. Readings from the Greek poet Homer; studies in Aeolic dialect, scansion, the "oral question," and related Homeric questions. Prerequisite: permission of instructor. (3W)

312. Seminar in Ancient Greek Prose and Poetry. Readings in Greek geared to the needs and interests of students, e.g., New Testament, historians, dramatists, orators, and poets. Prerequisite: permission of instructor. (3Sp) ®

399. Readings and Conference in Greek. Readings from Greek authors on various topics in accordance with individual student needs and interests. (1-5F,W,Sp,Su)

481. Advanced Readings in Ancient Greek. Variable topics in Greek authors. Advanced level readings. May be repeated for credit as topic changes. Prerequisite: permission of instructor. (3F,W,Sp,Su) ®

Hindi Courses

SK 101, 102, 103. Elementary Hindi. Basic overview and understanding of Hindi, the national language of India. (5) (5) (5)

201, 202. Intermediate Hindi. A second-year overview of pronunciation, grammar, and conversation. (5) (5)

Italian Courses

SK 101, 102, 103. Elementary Italian. Self-study with tutorial assistance. (5) (5) (5)

201, 202. Intermediate Italian. Self-study with tutorial assistance. (5F,W,Sp) (5F,W,Sp)

Japanese Courses

SK 101, 102, 103. Elementary Japanese. Communicative competencies in the four language skills: speaking, listening, reading, and writing with exposure to cultures and customs. Native speaker instructor. Japn 101 is a prerequisite to 102; Japn 102 is a prerequisite to 103. (5) (5) (5)

201, 202. Intermediate Japanese. A second-year overview of speaking, listening, reading, and writing Hiraganas, Katakanas, and some Kanjis with exposure to cultures and customs. Native speaker instructor. (5) (5)

203. Introduction to Written Japanese. Introduction to modern Japanese prose style, including mastery of 76 basic Kanji. Prerequisites: Japn 101, 102, 103, 201, 202. (5F,W,Sp)

301. Written Japanese I. Developing reading proficiency in simple written Japanese. Prerequisite: Japn 203. (5F)

302. Written Japanese II. Developing reading proficiency in simple written Japanese. Prerequisite: Japn 301. (5W)

303. Written Japanese III. Developing reading proficiency in simple written Japanese. Prerequisite: Japn 302. (5Sp)

Korean Courses

SK 101, 102, 103. Elementary Korean. A beginning course in Korean based on self-instructional tapes and written materials. Open to students with strong linguistic aptitude and interest. (5F,W,Sp) (5F,W,Sp) (5F,W,Sp)

201, 202. Intermediate Korean. An intermediate course in Korean based on self-instructional tapes and written materials. Open to students with strong linguistic aptitude and interest. (5F,W,Sp) (5F,W,Sp)

Latin Courses

SK 101. Elementary Latin. Students will learn basic Latin grammar, syntax, and vocabulary. Emphasis on memorization, formation, and identification of Latin words. (5F)

103. Intermediate Latin. Intermediate study of basic Latin grammar with focus on reading and syntactic analysis. Prerequisite: permission of instructor. (5W)

202. Advanced Latin. Advanced study of basic Latin grammar with focus on reading and syntactic analysis. Prerequisite: permission of instructor. (5Sp)

299. Individual Readings in Latin. Readings from Latin authors on various topics in accordance with individual students' needs and interests. (1-5)

310. Latin Prose Readings. Readings from various Roman authors, including Caesar himself, about the life and times of the great Roman general. Prerequisite: permission of instructor. (3W)

311. Latin Poetry Readings. Readings from Vergil's *Aeneid* and study of Latin poetry in the Augustan Age. Prerequisite: permission of instructor. (3W)

312. Seminar in Latin Literature. Readings in Latin geared to the needs and interests of students, e.g., Silver Age Latin, Roman Comedy, Church Fathers, Roman Historians, Roman Elegy, etc. Prerequisite: permission of instructor. (3Sp)

399. Readings and Conference in Latin. Readings from Latin authors on various topics in accordance with individual students' needs and interests. (1-5F,W,Sp,Su)

481. Advanced Readings in Latin. Variable topics in Latin authors. Advanced-level reading. May be repeated for credit as topic changes. Prerequisite: permission of instructor. (3F,W,Sp,Su) ®

Linguistics Courses

110. English Composition for Nonnative Speakers. Freshman-level writing course for nonnative speakers. Emphasizes mechanics and basic sentence and paragraph types used in academic work. (3F,W,Sp)

IO 340. An Introduction to Linguistics. Theory of language and survey of current approaches to phonology, morphology, syntax; language differentiation; native language acquisition; second language learning. (5F,Sp)

350. Teaching Modern Languages. A methods course for teaching majors or minors in any of the modern languages. Considers the context, effective methods, and significant trends in teaching modern languages. (4Sp)

390. Analysis of Cross-cultural Difference. Develops an awareness of what culture is and how it shapes perceptions and attitudes. Students learn to analyze cultural differences through inductive student-centered activities. (3F)

419 (d619).[1] Laboratory Methodology and Techniques in Foreign Language Instruction. For students who intend to become teachers of a foreign language. Teaching procedures, administrative and mechanical techniques relating to the language lab and its components. (2W)

450. Student Teaching Seminar. Focus upon problems arising during student teaching. Includes teaching plans, procedures, adaptive classroom practices, and evaluation. To be taken concurrently with ScEd 460. (3F,W,Sp) ®

453. Language and Society. The study of language varieties. The growth and emergence of dialects and an examination of their societal implications. (3)

492. Senior Practicum in Language Teaching. (1-3F,W,Sp,Su) ®

599. Readings and Conference. Additional readings or research done beyond the general introduction to linguistics given in Linguistics 340. Instructor's permission required. (1-5F,W,Sp,Su) ®

Graduate

617. Modern Composition Theory. (See Engl 617). (3)

619 (d419). Laboratory Methodology and Techniques in Foreign Language Instruction. (2Sp)

640. Information Technologies for Foreign Language Teaching. (3F)

651. Syntactic Analysis. (3W)

680. Topics in Second Language Acquisition. Advanced seminar in the acquisition and teaching of languages. Repeatable for credit with department approval. (3Su) ®

Portuguese Courses

NOTE: Elementary and Intermediate Portuguese taught only on sufficient demand.

SK 101, 102. Elementary Portuguese. Self-study with tutorial assistance. (5F) (5W)

103. Elementary Portuguese. Especially for Spanish speakers. (5Sp)

201, 202, 203. Intermediate Portuguese. Self-study with tutorial assistance. (3F) (3W) (3Sp)

299. Individual Readings. Individual study of selected readings in Portuguese. Instructor's permission required. (1-5F,W,Sp) ®

304. Advanced Grammar and Readings. Review of the more complex Portuguese grammatical points and reading and analysis of selected readings. (3F)

599. Readings and Conference. Readings in Brazilian and Portuguese literature. Instructor's permission required. (1-5F,W,Sp) ®

Russian Courses

SK 101, 102, 103. Elementary Russian. (5F,W,Sp) (5F,W,Sp) (5F,W,Sp)

201. Intermediate Russian. First Quarter. Further development of first-year skills and competencies. Emphasis is on language structure, as well as vocabulary expansion, conversation, reading, and writing in the context of culture. (5F,W,Sp)

202. Intermediate Russian. Second Quarter. Further development of basic skills and competencies. Emphasis is on language structure, as well as vocabulary expansion, conversation, reading, and writing in the context of culture. (5F,W,Sp)

299. Individual Readings. Individual study of selected readings in Russian. Instructor's permission required. (1-5F,W,Sp) ®

301. Contemporary Russian. Reading and discussion of contemporary popular, literary, and scientific materials in Russian. Also cultural and historical considerations of today's Russia. (2Sp)

304. Advanced Grammar Conversation and Composition I. Detailed presentation and review of Russian grammar, class discussions on Russian culture, and work on oral and written assignments. First of a two-course series. (3F)

305. Advanced Grammar Conversation and Composition II. Detailed presentation and review of Russian grammar. class discussions on Russian culture, and work on oral and written assignments. Second of a two-course series. Prerequisite: Russ 304. (3W)

599. Readings and Conference. Readings in technical, scientific, or literary Russian. Instructor's permission required. (1-5F,W,Sp) ®

Spanish Courses

SK 101. Elementary Spanish. First Quarter. Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Not open to students having had more than one year of Spanish in high school or the equivalent. (5F,W,Sp) ©

102. Elementary Spanish. Second Quarter. Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Not open to students having had Spanish 101 or at least one but not more than two years of Spanish in high school. (5F,W,Sp) ©

103. Elementary Spanish. Third Quarter. Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Open to students having completed Spanish 102. (5F,W,Sp) ©

104. Intensive Elementary Spanish. Intensive alternative course to Spanish 101, 102, and 103 in one quarter, emphasizing active usage. (15Su)

201.[2] Intermediate Spanish. First Quarter. Continued development of communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Prerequisite: Spanish 103 or at least two, but not more than three, years of Spanish in high school. (5) ©

202.[2] Intermediate Spanish. Second Quarter. Continued development of communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Prerequisite: Span 201. (5) ©

NOTE: Depending on previous language exposure and skills, students may enter the language sequence (101 through 202) at various levels. Consult with the department for details.

299. Individual Reading. Individual readings or projects in Spanish. Instructor's permission required. (1-5F,W,Sp) ®

301. Contemporary Hispanic Themes. Continued development of skills with emphasis on speaking. Materials based on contemporary Hispanic topics. Not open to students with foreign experience. (3Sp)

302. Advanced Spanish. An intense review of selected problematic areas of Spanish grammar for students with advanced language skills. Taught only in Costa Rica. (5Su)

303. Advanced Spanish. Taught only winter quarter in Mexico. (5W)

304, 305.[2,3] Advanced Grammar. An intense review of selected problematic areas of Spanish grammar for students with advanced language skills. (3) (3) ©

306. Advanced Conversation and Composition. Development of advanced conversation and writing skills through debate and composition on contemporary controversial topics. (3W)

310. Espanol Comercial. Study of vocabulary, idioms, and expressions used in Hispanic business communications and an introduction to Hispanic business practices. (3F)

****325. Latin American Culture and Civilization.** The historical, social, political, economic, and cultural conditions and institutions of the Latin American countries. (3W)

****326. Spanish Culture and Civilization.** The historical, social, political, economic, and cultural conditions and institutions of Spain. (3W)

****360. Survey of Spanish Literature.** Selective readings and discussion of major works and authors in Spanish literature from El Cid through Lope de Vega. (3F)

****361. Survey of Spanish Literature.** Selective readings and discussion of major works and authors in Spanish literature from Calderon through the nineteenth century. (3W)

****362. Survey of Spanish Literature.** Selective readings and discussion of major works and authors in Spanish American literature from the Modernist Movement to the present. (3Sp)

***363. Survey of Spanish American Literature.** Developments and trends in Spanish American literature from the sixteenth century to the Modernist Movement. (3F)

***364. Survey of Spanish American Literature.** Developments and trends in Spanish American literature from the Modernist Movement to the present. (3W)

401. Applied Linguistics. Analysis of selected morphological and syntactic features of the Spanish language including Spanish-English contrastive analysis. (3W)

402. Phonetics. Analysis of phonological and phonetic patterns of Spanish. (2W)

403. Mexican Culture and Civilization. The historical, social, political, economic, and cultural conditions and institutions of Mexico. Taught only winter quarter in Mexico. (5W) ®

****418. The Literature of the Siglo de Oro.** A study of the major works and authors of the Siglo de Oro: Lope de Vega, Tirso de Molina, Calderon de la Barca, and others. (4Sp)

***430. Cervantes.** A study of the major works of Miguel de Cervantes with emphasis on *Don Quixote.* (4Sp)

440.[4] Topics of Spanish Literature. Variable topics; course may be repeated with permission of instructor. (3F,W,Sp) ®

441.[4] Topics of Latin American Literature. Variable topics; course may be repeated with permission of instructor. (3) ®

***480. Hispanic Literature in Translation.** Major hispanic authors in translation. No prior study of Spanish necessary and course may be repeated for credit when course content is different. (3W) ®

499. Readings and Conference. Individual readings or projects in Spanish. Instructor's permission required. (1-5F,W,Sp) ®

Urdu Courses

SK 101, 102, 103. Elementary Urdu. A basic overview and understanding of Urdu, the national language of Pakistan. (5) (5) (5)

201, 202. Intermediate Urdu. A second-year overview of pronunciation, grammar, and conversation. (5) (5)

Philosophy Courses

HU 101. Introduction to Problems of Philosophy. Introduction to philosophical terminology and ideas. Modern-day problems of reality, thought, and value. (5) ©

HU 111. Ethics. Judgments concerning what is good or bad, right or wrong, and how these are justified and related to action. Relativism, subjectivism, absolutism, the selfish theory, freedom, and responsibility. (4W)

209. Practical Logic. Recognizing arguments; informal fallacies; uses of language; definition; analogical arguments; enthymemes; argumentation in arts, sciences, and law. (5W)

SK 210. Deductive Logic. Signs, symbols, and language in human reasoning. Structure of propositions; forms of valid inference; nature of deductive systems; recognition of formal fallacies. (5F,W,Sp) ©

211. Inductive Logic. Analogical argument; Mill's methods and discovery of causes; framing and testing hypotheses in everyday life and in science; nature of evidence; right and wrong uses of statistics, probability. (3W)

HU 215. Aesthetics. An introductory course exploring relations between philosophy and art; the reciprocal effect of aesthetic categories and metaphysical concepts; the nature of genius and creativity. (3F,Sp)

308. History and Thought of the New Testament. Historical and intellectual context of the development of the New Testament. Character, ideas, and historical setting of the various documents. (3Sp)

****310. History of Ancient Philosophy.** Development of philosophical thought in the ancient Greek world. Emphasizes reading from the pre-Socrates, Plato, Aristotle, the Stoics, and Epicureans. (4F)

***311. History of Medieval Philosophy.** Neo-Platonism with stress on Plotinus, St. Augustine, and early Christian philosophy. Early medieval thought. St. Thomas Aquinas and rise of scholasticism. Philosophic thought in the Renaissance. (4F)

312. Seventeenth Century Philosophy. Philosophic ideas in science, logic, religion, ethics, politics, metaphysics, and epistemology among Hobbes, Descartes, Spinoza, Leibniz, and Locke. (3F)

314. Eighteenth Century Philosophy. Philosophic ideas in science, logic, religion, ethics, politics, metaphysics, and epistemology among Berkeley, Hume, Kant, Rousseau, and Voltaire. (3W)

****315. Twentieth Century Philosophy.** Readings and discussion of major philosophies of the twentieth century, including philosophers from Russell to Austin. (3F)

***316. Nineteenth Century Philosophy.** European thought from Kant to Nietzche. Metaphysics, ethics, logic, and theory of knowledge of such thinkers as Bentham, Mill, Comte, Hegel, Schophenhauer, Marx, and Nietzsche. (3Sp)

325. Medical Ethics. Key issues in medicine, including consent, confidentiality, competency, abortion, suicide, and euthanasia. Philosophical, legal, and practical perspectives addressed. (3F)

326. Business Ethics. Pressing ethical issues in business, including foreign bribery, corporate responsibility, individual good vs. common good, justice, and preferential liking. (3W)

327. Environmental Ethics. Key ethical issues in treatment of nature, animals, and the environment. Topics include animal rights, the value of wilderness, ecology and the common good, and environmental asthetics. (3Sp)

HU 337. Mind Sets. To study the contrast between the classical analytical perspective in western culture and the recent synthetic perspective. The contrast will be explored in terms of the philosophy of science from Descartes to Toulmin and corresponding perspectives in literature from the seventeenth century to the postsurrealistic period. (3Sp)

****350. Philosophy of Religion.** Problems in defining "religion;" the existence of God; problems of evil; the immortality of the soul; religious experience; faith; alternatives to theism; religious language. (3W)

***370. Existentialism.** Examination of such writers as Dostoevsky, Kierkegaard, Nietzche, Kafka, Jaspers, Heidegger, Sartre, and Camus. (3Sp)

380. Philosophy in Literature. An examination of philosophical topics as presented and developed in works of literature such as Aristophanes' *The Clouds*, J.P. Sartre's *The Age of Reason*, or H. Hesse's *Siddhartha*. (3W)

****401. Metaphysics.** Treats systematically the first cause of things. Causality, space and time, idealism versus realism, universals, matter, essence and existence; the mind; the role of God. (3Sp)

415. Philosophy of Law and Politics. An examination of theories in law and politics, their purpose in society, and their relation to other practices and institutions. (3Sp)

420H. Philosophy Senior Honors Seminar. Overview of philosophical problems and methods. Capstone course for philosophy honors program. (3Sp)

421H. Senior Honors Thesis. Independent research credits for preparation of a senior honors thesis to fulfill requirements of philosophy honors program. (1-9F,W,Sp)

422. Symbolic Logic. Deductive systems, valid and invalid arguments; logical paradoxes; sentential calculus, and predicate calculi. Axiom systems and metatheory. Prerequisite: Phil 210 or approval of instructor. (5Sp)

***430. Theories of Knowledge.** Problems in the theory of knowledge ranging from induction to the nature of sense data, emphasizing the use of modern techniques in clarifying classical epistemological issues. (3Sp)

***431. Concept of Mind.** Various theories of mind, and concepts of action and behavior as they relate to desire, belief, sensation, pain, and perception. The mind/machine issue. (3F)

444. Ethical Problems. Ethical principles applied to a variety of carefully developed problems using dramatic videotaped panel discussions of issues such as loyalty, privacy, and confidentiality. (4W)

***485 (d685).[1] Philosophy of Language.** Nature and uses of language. Concepts of meaning, reference, truth, name, syntax, semantics, pragmatics, metaphor, ambiguity, vagueness, definition. Applications in psychology, linguistics, anthropology, and literary criticism. Prerequisite: Phil 210 or approval of instructor. (3Sp)

488. Special Topics. Detailed consideration of particular philosopher or particular philosophical problem. Instructor approval required. Course may be repeated when different topic is discussed. (3F,W,Sp) ®

490 (d689). Philosophy of Science. Foundations of the physical and biological sciences with emphasis on scientific method, models and their uses, theories and explanations, reductionism, and paradigms. (3Sp)

495. History of Scientific Thought. Examination of key episodes in the history of science and associated ideas about the nature of scientific knowledge and the ways it may be acquired. (4W)

499. **Readings and Research.** The works of a particular philosopher or school of philosophy. Consent of instructor required. (1-5F,W,Sp) ®

Graduate

605. Philosophy of History. (3F)

609. Philosophy of Social Sciences. (3F)

***685 (d485). Philosophy of Language.** (3Sp)

689 (d490). Philosophy of Science. (3Sp)

690. Independent Study. (1-5F,W,Sp) ®

Language Courses

420H. Senior Honors Seminar. Capstone course for Honors degree in French, German, or Spanish. Gives broad overview of foreign language study and its value and applications. (3Sp)

421H. Language Senior Honors Thesis. Independent, directed reading and research for students seeking Honors degree in French, German, or Spanish. Through this research, students produce an Honors Senior Thesis. (1-5Sp)

Speech Courses

105. Public Speaking. Speaking in formal public communication situations; development of skills in speech preparation, delivery, and audience adaptation. (3F,W,Sp)

SS 260. Interpersonal Communication. Communication skills in establishing and maintaining interpersonal relationships; relevant theories, behavioral skills, and role playing applied to communication in a variety of settings. (3F,W,Sp,Su)

300. Speech Teaching Practicum. Supervised on-campus speech teaching experience. Must be completed prior to student teaching experience. Repeatable to a maximum of 2 credits. (1-2F,W,Sp) ®

305. Technical and Professional Communication. Skill development in oral technical reporting, interviewing, and interpersonal communication to meet the unique communication requirements of business, industry, and the professions. (3F,W,Sp)

325. Organizational Communication. Study of internal communication requirements of organizations. Identification of communication problems associated with conflict, interpersonal influence, communication barriers, and information flow. Prerequisite: upper-division standing. (3W)

333. Intercultural Communication. Study of how communication shapes culture and how culture, in turn, affects communication. Development of effective intercultural communication in business and personal contexts. (3W)

428. Argumentation and Debate. Techniques of analysis, investigation, evidence, reasoning, briefmaking, refutation, and construction and delivery of the argumentative speech. (4F)

500. Studies in Speech Communication. Study of special topics in interpersonal, small group, organizational, or intercultural communication theory and research. (1-5F,W,Sp,Su)

****509. Small Group Communication Theory.** Survey and analysis of theories and research in small group communication. Emphasis on decision-making groups. (3Sp)

***528. Communication Education Theory and Application.** Examination of contemporary theories in the field of communication education. Emphasis on communication apprehension, speech evaluation, classroom climate, teaching methods, and the basic course. (3Sp)

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*Taught 1996-97.

**Taught 1997-98.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]This course is taught every year, but not every quarter. Check with department for current offerings.

[3]These courses are not open to native speakers, unless they are registered Spanish majors and obtain the permission of the instructor.

[4]This course is not offered every year. Check with department for current offerings.

Department of
Management and Human Resources
*College of Business**

Head: Professor John R. Cragun
Office in Business 411, 797-2787

Professors Leon R. McCarrey, Glenn M. McEvoy, Y. Krishna Shetty, David B. Stephens; **Professors Emeritus** Vernon Buehler, Howard M. Carlisle, Richard L. Smith; **Associate Professors** Caryn L. Beck-Dudley, David R. Daines, Steven H. Hanks, Ross E. Robson; **Associate Professor Emeritus** Glenn F. Marston; **Adjunct Associate Professor** Val R. Christensen; **Assistant Professors** David A. Baucus, Melissa S. Baucus, Gaylen N. Chandler; **Senior Lecturers** Lawrence H. Siebers, Sharon Tarnutzer

Degrees offered: Bachelor of Science (BS) and Bachelor of Arts (BA) in Management; BS and BA in Human Resource Management; participates in Master of Social Science (MSS) in Human Resource Management

Objectives

The programs in the Department of Management and Human Resources are designed to prepare men and women for administrative and leadership positions in business, government, and other institutions. Specialized training is provided in Management and in Human Resource Management, as well as training directed at understanding the broader aspects of business as it functions within a national and international environment. The study of management is approached from an organizational leadership framework.

Management deals with the skills and attributes of organizational leadership. These include the ability to critically assess issues currently facing one's organization or unit; the ability to develop a vision for the organization and translate it into a mission, objectives, and strategies; and the ability to accomplish these through the acquisition and allocation of resources, and organizing, leading, and empowering people.

Human Resource Management deals with those processes which provide, develop, and maintain a productive workforce. Subject areas include recruiting employees, determining what tasks need to be performed, placing the right person on the right job, determining fair benefits and compensation, evaluating performance, determining current and future employment needs, career pathing, training and development, labor-management relations, and following legal/ethical practices in employment.

Requirements for Majors

Departmental Admission Requirements. New freshmen admitted to USU in good standing qualify for admission to the College of Business. Students with 1-69 quarter hours of credit, who are transferring from other institutions or from other colleges at USU, need a minimum overall GPA of 2.20. Students transferring with 70 or more quarter hours of credit are required to have a minimum overall GPA of 2.50. Upon admission, all degree-seeking students will be identified with the College of Business Prespecialization Unit for the purpose of qualifying for advanced standing within their chosen major field. Transfer students and others desiring to be admitted to advanced standing in the Department of Management and Human Resources must meet the prespecialization requirements stated below.

Prespecialization. For approximately the first two years, a student will be identified with the College of Business Prespecialization Registration Unit. The basic objective of this portion of the student's studies is to provide a broad and sound educational foundation upon which to build a specialized education relating to business.

All students at the University are required to satisfy the General Education requirements of the University as described in the Undergraduate Requirements section of this catalog. Additional requirements for Management and Human Resources majors consist of two basic components.

1. College of Business Prespecialization Core. The following courses are required: Acct 201, 203; BIS 140[1], 255; Econ 200[1], 201[1]; Math 105[1]; MHR 100, 299; CS 150 or 170[1]; Stat 230.

2. Department of Management and Human Resources Prespecialization Requirement. The following courses are required for majors in Management and Human Resources: Math 215; Soc 101 or Psy 101; Spch 260, 305, or BIS 245.

Completion of 30 credit hours of university work with a minimum GPA of 2.2 is necessary before a student is allowed to enroll in BIS 255; Acct 201, 203; and MHR 299.

Access to 300-level Management and Human Resources courses is restricted. Only those students who have completed a minimum of sixty (60) quarter credits with a minimum GPA of 2.50 will be allowed to enroll in 300-level Management and Human Resources courses.

College of Business Enrollment Restrictions. Admission to the college does not insure access to the prespecialization core courses required for graduation. The following admission requirements must be met by all USU students:

1. An overall GPA (transfer credits included) of 2.20 and 30 credits of completed college-level work are required for admission into Acct 201, 203; MHR 299; and BIS 255.

2. An overall GPA of 2.50 and completion of 45 credits are required for admission into Acct 311 and 331.

3. An overall GPA of 2.50 and completion of 60 credits are required for admission into Acct 312, 313, 332, 341; BA 308, 340, 350, 370; BIS 310, 314, 330, 355, 371; Econ 340; and MHR 311, 360.

4. All 400- and 500-level courses in the College of Business, with the exception of Economics courses and MHR 489, are restricted to students with unconditional advanced standing. A 2.50 overall GPA and completion of 90 credits are required for admission into these courses.

5. An overall GPA of 2.50 and completion of 125 credits are required for admission into MHR 489.

Advanced Standing. The objective of the advanced standing portion of the program is to provide sufficient specialized business training to prepare the student to successfully enter the business

*All undergraduate and master's business programs offered by the College of Business are accredited by the American Assembly of Collegiate Schools of Business (AACSB).

world in a chosen field of interest. The program is also directed at providing the type of business education that develops the attitudes, analytical ability, and the social conscience required for future professional advancement.

Students are required to achieve unconditional advanced standing to be admitted to the Department of Management and Human Resources. Until they have attained unconditional advanced standing, students are not allowed to take 400-level courses.

The requirements for attaining unconditional advanced standing in the Department of Management and Human Resources are as follows:

1. Students must have completed a minimum of 85 credits and must have earned an overall grade point average (GPA) of at least 2.50 for all the hours of study taken up to the time the petition for advanced standing is made. This will include all transfer credits.

2. Students must have completed the prespecialization requirements for both the College of Business and the Department of Management and Human Resources, as indicated above, and must have earned a GPA of 2.50 or above in these courses.

(Some courses may have prerequisites, and students would be expected to satisfy the course prerequisites as well.)

3. File a request for advanced standing with the College of Business Student Service Center, Business 306.

It is strongly recommended that each student make the transition from prespecialization in the college to unconditional advanced standing in the Department of Management and Human Resources as soon as possible after having met the 85 credit requirement.

During the initial portion of the Management and Human Resources upper-division program, all degree seeking students will be required to take the following core classes, which are designed to provide a broad background in the various areas of business: BA 308, 340, 350, 370; MHR 311, 412, 489[2]; Econ 340; Econ 401 or 501 (strongly recommended).

During the latter portion of the program, the student working toward a degree in the Department of Management and Human Resources will be devoting his or her efforts toward fulfilling the requirements in one of the two areas of specialization.

Major in Human Resource Management. In addition to the basic core requirements, students majoring in Human Resource Management must complete the following 32 credit hours: MHR 312, 360, 361, 362, 455, 463, 469, 470, 476; Econ 521; Econ 566 or BIS 435. Note: MHR 312 must be the *first* course taken in the program.

Major in Management. In addition to the basic core requirements, students majoring in Management must complete 30 credit hours as follows: MHR 313, 360, 361, 362, 435, 470, 476, plus either Option A or Option B. *Option A:* MHR 477, 478, and one course outside the department, as determined through advisement. *Option B:* MHR 425 (3 credits minimum) and two additional courses outside the department, as determined through advisement. Through advisement and proper selection of courses outside the department, a student can accommodate personal goals and objectives, such as entrepreneurship and international study. Note: MHR 313 must be the *first* course taken in the program.

If a student elects to take a minor, he or she is encouraged to select one from outside the College of Business.

Requirements for Minors

A minor in Management and a minor in Human Resource Management are available, as outlined below. Any deviation from the programs as outlined must be submitted in writing, with justification for the changes, to the department head for approval. A 2.50 GPA in the minor courses is required.

Minor in Management. This minor is **for students with majors outside the College of Business** who expect to work in an organization where they will assume leadership or management responsibilities. The Management minor consists of a minimum of 21-22 credits. The following courses are required and must be taken early in the program: MHR 311, 313. In addition, five courses must be selected from the following: MHR 360, 361, 362, 435, 470, 476. Note: MHR 313 must be the *first* course taken in the program.

Minor in Human Resource Management. This minor is **for students with majors outside the College of Business** who want to work in any of the human resource functions of an organization. The Human Resource Management minor consists of the following required courses (23-24 credits): MHR 311, 312, 455, 463, 469, 476; Econ 566 or BIS 435; Econ 521. Note: MHR 312 must be the *first* course taken in the program.

Minors for Students with majors within the College of Business. Students with majors within the College of Business may elect to take a minor in either Management or Human Resource Management. In such cases, in consultation with the head of the Department of Management and Human Resources, an appropriate minor will be determined based on the student's career objectives. Students will be expected to complete 18 credits of related coursework beyond the College of Business Prespecialization Requirements and Core Requirements. All such minors must be approved by the head of the Department of Management and Human Resources.

Graduation Requirements

To be recommended by the department for graduation, majors in the Department of Management and Human Resources must have a grade point average of at least 2.50 in their upper-division core and specialization courses, as well as an overall GPA of 2.50. This includes transfer credits. The College of Business requires that at least 93 quarter credits be taken in courses taught outside the College of Business. Up to 13.5 quarter credits (9 semester credits) of economics and 9 quarter credits (6 semester credits) of statistics can be considered as courses taught outside the College of Business. At least fifty percent of the business credits required for a business degree must be taken on the Utah State University campus or at a designated residence center.

Student Organizations

The department sponsors two student organizations. Membership in the organizations is open to all students, both undergraduate and graduate, who meet the membership requirements.

Sigma Iota Epsilon (SIE) is a national Honorary Management Fraternity sponsored by the Academy of Management.

Society for Human Resource Management (SHRM) is the professional Human Resource Management organization co-sponsored by the Bridgerland Chapter of SHRM.

Graduate Study

The department offers a Master of Social Science (MSS) degree in Human Resource Management.

The college also offers the Master of Business Administration (MBA) degree. The MBA is designed to give training of a general management nature and does not emphasize specialization in any

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[1]These course credits can be counted toward satisfying the General Education requirements. A minimum of 25 additional credits will be necessary to complete the General Education requirements.

[2]The MHR 489 Business Policy course is a capstone course and should not be taken until near the end of the senior year.

one of the functional fields of business. Both of these degrees are open to all students regardless of undergraduate major. See *Graduate Catalog* for more information.

Management and Human Resources Courses

100. Business Orientation. Orients freshmen and transfer students to College of Business programs, academic and student services, professional organizations, and career possibilities. (1F,W,Sp)

116. Life Management Skills. A practical course designed to provide basic life skills. For freshman and sophomore students only. Offered on a pass/fail basis. Contact Life Skills Coordinator for details. (1F,W,Sp,Su)

225. Introductory Internship. An introductory-level experience in a career-related position approved by the cooperative internship office. One credit for every 75 hours of internship experience. Maximum 6 credits. (1-6F,W,Sp,Su) ®

235. Small Business Management. This program of instruction is designed to provide students with a practical overview of management principles and practices as they apply to the small business enterprise. For nonbusiness majors. (3Sp) ©

299. Fundamentals of the Legal Environment of Business. This course covers in detail introduction to law, contracts, agency, and business organization. It surveys the legal environment of marketing, personnel, real estate, and finance. Lecture and laboratory. (4F,W,Sp,Su)

SS 311. Managing Organizations and People. Introduction to the history, changing context, and purposes of management. Human performances, selection, coaching, motivation, and dealing with performance problems. (4F,W,Sp,Su) ©

312. Introduction to Human Resource Management. Required entry seminar including an orientation to the discipline, discussion of career options, and establishment of expectations for Human Resource Management major. (1F,W,Sp,Su)

313. Introduction to Organizational Leadership. Required entry seminar including an orientation to the discipline, discussion of career options, and establishment of expectations for majors in organizational leadership. (1F,W,Sp,Su)

316. Leadership Training/Group Dynamics. Concepts of self-assessment, goal setting, achievement motivation, leadership, discussion leading, small group functioning, and performance feedback. (1-3F,W,Sp,Su) ®

325. Discussions with Business Leaders. Examines new methods for improving U.S. competitiveness by attending the Partners Program seminar sessions and hosting visiting executives from top U.S. companies. Repeatable to maximum of 6 credits. (1F,W,Sp,Su) ®

360. Developing Team and Interpersonal Skills. Experientially-driven course focusing on the role of teams in organizations and on developing skills which individuals and teams need to be effective. (4F,W,Sp,Su)

361. Leading Organizational Change. Students learn the process of leading change at the individual, group, and organizational levels. Topics include organizational culture, power, structure, and case studies of change. (3)[4]

362. Contemporary Management Issues. Exploration of issues, techniques, and processes representing leading edge management practices in national and international organizations. (3)[4]

412. Business and Society. Examines political, legal, conceptual, institutional, and moral foundations of business and its changing role. Assessment of business involvement in urban, community, consumer, and environmental affairs. Prerequisite: senior standing. (3F,W,Sp,Su)

425. Advanced Internship. An advanced or middle-level experience in a career-related internship position approved by the cooperative internship office. One credit for 75 hours of internship experience. Maximum of 12 credits. (1-12F,W,Sp,Su) ®

435. Entrepreneurship and New Venture Management. Processes, methods, and steps involved in starting a new venture such as a small business. Emphasizes the planning, financing, conception, and management of new firms. (4Sp)[4] ©.

455. Staffing Organizations. Methods and principles of staffing organizations, including job analysis, recruitment, statistics, affirmative action, criterion measurement, selection, and interviewing. (3)

463. Compensation and Benefits Administration. Analysis of compensation policies and programs: job evaluation, job pricing, salary surveys, pay for performance, and benefits administration. (3W)

469. Advanced Human Resource Management. Capstone integrative course for Human Resource Management majors and minors. Involves the application of concepts and principles in running a human resources department and handling people issues. Prerequisite: senior standing. (3Sp)

470. Managing in a Global Context. Exploration of the international context of management, the extent of globalization in business today, the pressures to operate in global markets, and the processes of management. Prerequisite: MHR 311. (3)[4]

476. Employment Law. Examines the laws related to employment, labor relations, civil rights, and compensation. Sensitivity to the legal environment in the work place will be emphasized. (3)

477. Senior Leadership Project I. Students use leadership skills developed in prior classes to plan and implement projects. They gain practical experience and demonstrate ability to contribute to organizational goals. Prerequisite: senior standing. (3)[4]

478. Senior Leadership Project II. The second of a two-course sequence. Students complete leadership projects, present results, and document accomplishments. Prerequisites: senior standing and MHR 477. (3)[4]

480. Independent Research and Reading. (1-5F,W,Sp,Su) ®

485H. Senior Honors Seminar. Presentation of senior thesis project created in the 495H course. Focus is on scholarly approach, problem definition, and methodology. (1Sp)

489. Business Policy. A capstone course to develop perspective, judgment, and facility in solving problems in production, distribution, personnel, finance, control, and social aspects of business. Prerequisites: MHR 311, BA 340, 350, 370. (4F,W,Sp,Su)

495H. Senior Honors Thesis. Creative project that will then be written up as a Senior Thesis as required for an Honors Plan. (3-9F,W)

501 (d601).[1] Advanced Business Law. A detailed investigation of business law, including the law of contracts, torts, property, secured transactions, commercial paper, and business organizations. Prerequisite: MHR 299. (4Sp)

564 (d664). Selected Topics in Management and Human Resources. Selected topics in management and/or human resources are pursued in depth. Topics and instructor may vary. Prerequisites: senior or graduate standing, approval of instructor. (1-4)

Graduate[2]

600. Survey of Business Law. Also taught in Ogden.[3] (3)

601 (d501). Advanced Business Law. (4Sp)

609. Survey of Management and Organizational Behavior. Also taught in Ogden and over COMNET.[3] (4F)

625. Graduate Internship. (1-6F,W,Sp,Su) ®

655. Human Resource Planning and Staffing. Also taught in Ogden and over COMNET.[3] (3F)

661. Performance Management. Also taught in Ogden and over COMNET.[3] (3F)

662. Human Resources Management. Also taught in Ogden.[3] (3W)

663. Compensation and Benefits. Also taught in Ogden and over COMNET.[3] (3W)

664 (d564). Selected Topics in Management and Human Resources. (1-4)

665. Interpersonal Effectiveness in Management. Also taught in Ogden.[3] (3Sp)

666. Organizational Leadership, Influence, and Change. Also taught in Ogden.[3] (3F)

667. Labor Relations. Also taught in Ogden and over COMNET.[3] (3Sp)

669. Human Resource Policy and Strategy. Also taught in Ogden and over COMNET.[3] (3Sp)

676. Employment Law. Also taught in Ogden and over COMNET.[3] (3Sp)

681. Management and Organizational Behavior. Also taught in Ogden.[3] (4F)

683. Business and Society. Also taught in Ogden.[3] (3W)

686. Management of Technology/Innovation. Also taught in Ogden.[3] (3W)

689. Business Strategy. Also taught in Ogden.[3] (4F,Sp)

690. Independent Research and Reading. Also taught in Ogden.[3] (1-5F,W,Sp,Su) ®

696. Professional Paper. Also taught in Ogden.[3] (4F,W,Sp,Su)

697. Thesis. (1-9F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-3F,W,Sp,Su) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

[3]For more information on Ogden and COMNET classes, contact the Department of Management and Human Resources.

[4]For the quarter(s) this course will be taught, contact the Department of Management and Human Resources.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

Department of

Mathematics and Statistics

College of Science

Head: Professor Jerry Ridenhour
Office in Lund Hall, 797-0244
Assistant Head: Associate Professor D. Richard Cutler
Office in Lund Hall, 797-2811

Professors Ian M. Anderson, LeRoy B. Beasley, James S. Cangelosi, Lawrence O. Cannon, Chris S. Coray, Lance L. Littlejohn, L. Duane Loveland, Renate Schaaf, Donald V. Sisson, Russell C. Thompson, Homer F. Walker, Stanley C. Williams; **Professors Emeriti** Ronald V. Canfield, Joe Elich, Konrad Suprunowicz, David White; **Associate Professors** Antone H. Bringhurst, Adele Cutler, E. Robert Heal, Kevin Hestir, Joseph V. Koebbe, Kathryn Turner, E. Eugene Underwood, Zhi Qiang Wang; **Associate Professors Emeriti** Robert G. Hammond, Mary Nelson, Wayne R. Rich, James D. Watson; **Assistant Professors** Daniel C. Coster, Michael C. Minnotte, Daniel K. Nakano, James Powell, Emily Stone, Xiadong Zheng; **Principal Lecturers** David D. Bregenzer, Beverly Ridenhour, Eric Rowley

Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA), and Master of Science (MS) in Mathematics; BS and BA in Mathematics Education; Master of Mathematics (MMath); Doctor of Philosophy (PhD) in Mathematical Sciences; BS, BA, and MS in Statistics; PhD specializations in College Teaching, Interdisciplinary Studies, Pure and Applied Mathematics, and Statistics under Mathematical Sciences Program

Objectives

The Department of Mathematics and Statistics offers a variety of courses designed to prepare students for careers in teaching or for positions as mathematicians or statisticians in industry or governmental agencies. The department also provides service courses for many other groups of students.

Placement of New Students

The mathematics ACT score is used for placement in the 100-level mathematics courses. New students and students who are registering for a math class at USU for the first time should have a math ACT score of at least 18 to register for Math 101 or at least 23 to register for Math 105 and 106. The alternative to this is to take a placement examination in the Testing Services Office, University Inn 115. Students who have already taken a USU mathematics class may register for the next higher numbered course upon receiving a grade of *C-* or better in the prerequisite. Entering students with math ACT scores of less than 18 should either register for Math 001 (arithmetic), 002 (beginning algebra), or take the placement examination to qualify for a higher level course. The placement exam requires a small fee.

Entering students with an AP score of 4 are usually able to begin calculus with Math 221. An AP score of 5 should allow the student to begin in Math 222.

The calculus sequence Math 220, 221, 222 is for students in mathematics, engineering, and most sciences; and the calculus sequence Math 215, 216 is primarily for business and a few other majors. Calculus students all need strong backgrounds in the material covered in Math 101 and 105, but the Math 220, 221, 222 sequence also requires trigonometry (Math 106) and a graphics calculator.

Students with outstanding mathematics records in high school and transfer students with some experience in calculus may wish to consult with a mathematics adviser prior to registration.

Undergraduate Study

Departmental Requirements. Admission requirements for the Department of Mathematics and Statistics are the same as those described for the University on pages 8-11. Students in good standing may apply for admission to the department.

Students in the Department of Mathematics and Statistics must complete the USU Written Communication and General Education Requirements described on pages 22-28 of this catalog. Please note that the "Broadening Knowledge" portion of General Education may also be satisfied by completing the Area Studies Certificate in the Liberal Arts and Sciences Program.

For those students who enter the University with advanced placement in mathematics and approximately 30 hours of CLEP or AP credit, it is possible to complete a master's degree (MS) in mathematics or statistics within a four to five year period. Interested students should consult their undergraduate adviser.

General College of Science Requirements

Orientation Requirement. All students graduating from the College of Science are required to take the college orientation course: Sci 150, Science Orientation.

Written Communications Requirement. In addition to the University's written communication requirement, the college requires a junior-level writing class. This requirement may be filled by completing either English 301 or 305.

Bachelor of Science Core Requirements. Students working toward the Bachelor of Science degree in any major within the College of Science must complete the following:

A. Math 220 and 221.

B. Either CS 160 or Stat 201.

C. One of the following sequences: (1) Biol 125 and either Biol 126 or Biol 127; (2) Chem 121, 122, and 124; (3) Geol 111 and 200; (4) Phyx 221 and 222.

Majors in Biology, Chemistry and Biochemistry, Geology, and Physics **cannot** satisfy requirement *C* by taking a sequence in their own discipline. Higher level courses than the ones listed in the three categories above may be substituted in some instances. Approval for any substitutions must be obtained in advance.

Note: The above Bachelor of Science requirements are **not** in effect for the Bachelor of Arts degree.

Bachelor of Science in Mathematics. The regular major in mathematics has flexible requirements and is designed to prepare students for careers in industry or to prepare students for graduate study in mathematics (including those who plan to teach mathematics at the college or university level). Math 320, 321, 322, 331, 420, 471 or 571, 521, 522, 523, and 531 are required. Students must also elect 18 credits of mathematics courses at the 400 level or above. Students who plan to study mathematics on the graduate level should take at least one of the following sequences: Math 531, 532, and 533; or Math 551, 552, and 553. Only one of Math 461, 462, and 463 may be counted. Math 471 and 571 may not be counted in the electives.

Bachelor of Science in Mathematics (Computational Option). A student may choose this option rather than the regular BS described above. The coursework is intended to cover a wider range of topics in the area of numerical and computer analysis. Required courses are Math 320, 321, 322, 331, 420, 471 or 571, 521, 522, 523, 561, 562, 563; CS 170, 171, 172, 220, 227, 327. The student must also elect 6 credits of mathematics courses numbered above 400 and 6 credits of computer science courses numbered above 400. Math 461, 462, 463, 471, and 571 may not be counted in the electives.

Interdisciplinary Majors. Students who have interests in two or more major areas are encouraged to discuss individually designed degree programs with advisers. Such programs normally entail the completion of essential requirements in two complementary areas. Cooperating departments may agree to waive some requirements in each major to allow a student to obtain such a dual major, but the total number of required courses will often exceed the total required for either major, singly.

At the time of printing this catalog, three interdisciplinary dual majors have been approved: Mathematics-Physics; Mathematics-Statistics; and Mathematics-Electrical Engineering.

The **Mathematics-Physics** major requires the following courses: Math 220, 221, 222, 320, 321, 322, 331, 420, 471 or 571, 521, 522, 523; Phyx 221, 222, 223, 341, 342, 343, 374, 375, 387, 388, 398, 461, 462, 463, 471, 472. Also, students must elect 12 credits from mathematics courses numbered above 400 and complete at least one of the Physics sequences 401, 402 or 411, 412 or 451, 452. Math 471 or 571 may not be counted in the electives.

The **Mathematics-Statistics** major requires the following courses: Math 220, 221, 222, 320, 321, 322, 331, 420, 471 or 571, 521, 522, 523, 572, 573; Stat 301, 502, 505. Also, students must take 6 credits in Math courses numbered above 400 and 6 credits in Stat courses numbered above 500. Math 471 or 571 may not be counted in the electives.

The **Mathematics-Electrical Engineering** major requires completion of all EE required courses, including Phyx 221-223, plus the following mathematics courses: Math 220, 221, 222, 320, 321, 322, 331, 420, 471 or 571, 521, 522, 523. Also, the student must elect 12 additional credits from mathematics courses numbered above 400. Math 471 or 571 may not be counted in the electives.

Bachelor of Science in Mathematics Education. The department offers a degree in Mathematics Education for those who want to teach in the secondary schools. The requirements for this degree are Math 220, 221, 222, 311, 312, 320, 321, 322, 331, 384, 420, 462, 471 or 571, 531, and Stat 201. It is recommended that students take CS 170 to fulfill the computer literacy requirement of the professional education component.

For admission to the teacher education program with a major or minor in mathematics education, students must have a GPA of at least 3.0 in the equivalent of Math 220, 221, 222, and 320. Students must complete at least 80 percent of the major courses with at least a 2.75 GPA before admission to student teaching. No more than a total of three repeats in required courses may be used in the GPA computation.

The prospective secondary school teacher should combine the mathematics course requirements with the requirements for State Certification, which include the completion of an approved teaching minor. The complete Mathematics Education requirements, together with certification requirements and a listing of approved teaching minors, are described in the document *USU Secondary Teacher Education Program Undergraduate Planning Guide*. This publication is available at the University Bookstore.

Students may also satisfy the department's requirements to teach in the secondary schools by completing the regular mathematics major described in a previous section, provided the 18 credits of electives include Math 311 and 312. Again, students electing this option must meet the requirements for state certification and have a teaching minor.

A teaching minor in mathematics is also available. Required courses are Math 220, 221, 222, 309, 311, 320, 321, 331, 384; and Stat 201.

Bachelor of Science in Statistics. Statistics is the branch of science which deals with the development and usage of statistical inference. Statistical inference is the inductive process of generalizing from the particular to the general on the basis of sample evidence. The foundation of statistical inference lies in the theory of probability, which provides a measure of reliability of the conclusions drawn from experimental data.

Statisticians find employment in business, education, the Federal Government, state governments, private research groups, and as actuaries for the insurance industry.

Required courses are Math 320, 321, 331, 471 or 571, 572, 573; BA 308; Stat 301, 492, 502, 503, 505; CS 170, 171. Students must also elect 18 additional credits from statistics courses numbered above 400. Up to 9 credits from Math 420, 532, 533, 557, 558, 559, 561, 576, 577 may be counted toward the 18 elective credits.

Actuarial Science Option. A student may elect to pursue the Actuarial Science Option as part of either the major in Mathematics or the major in Statistics. An actuary is a business professional who uses mathematical skills to define, analyze, and solve financial and social problems. Most actuaries are employed by insurance companies, independent consulting firms, and government agencies.

Required courses are Math 320, 321, 322, 331, 557, 558, 559, 471 or 571, 572, 573; Stat 301, 502, 505; CS 241; Acct 201, 203; BA 308, 340, and 442. Degree candidates in this option must successfully complete Exam 100, Calculus and Linear Algebra, which is administered by the Society of Actuaries.

Bachelor of Arts Degree. For this degree, students must complete the requirements for a BS degree (above) plus two years' training or equivalent in a foreign language approved by the Languages and Philosophy Department.

Mathematics Minor. This department approved minor consists of Math 220, 221, 222 (or equivalent); Math 320, 321, 322; and 6 credits in courses numbered above 400. Only one of Math 461, 462, and 463 may be counted. A grade point average of 2.0 is required, and this average will be calculated using all grades

received in the above required courses, including earlier grades in repeated courses.

Statistics Minor. Required courses include Stat 301, 502, 505, and 9 credits from Stat courses numbered above 400 or from Math 471 or 571, 572, 573, 576, or 577. A grade point average of 2.0 is required, and this average will be calculated using all grades received in the above required courses, including earlier grades in repeated courses.

Grades

All courses to be used as prerequisites must be completed with a grade of *C-* or better. All departmental grades in courses counting toward graduation in all departmental programs must be no less than *C-* and must average 2.0 or better. The *P-D-F* option may not be used for any required courses.

Graduate Study

The Department of Mathematics and Statistics offers four graduate degrees: PhD in Mathematical Sciences (including a statistics option), Master of Science in Mathematics or Statistics, and Master of Mathematics. See the *Graduate Catalog* for prerequisites and further information.

Mathematics Courses

001. Basic Mathematics. For students who need a review of basic arithmetic skills.[1] (5F) ©

002. Elements of Algebra. A review of elementary algebra in preparation for Math 101.[1] (5F,W,Sp,Su) ©

SK 101. Intermediate Algebra. Linear equations and inequalities, polynomials and exponents, rational expressions, roots and radicals, quadratic equations and inequalities, lines, and systems of linear equations. Prerequisite: a math ACT score of at least 18, or a passing grade in Math 002, or a satisfactory score on a placement exam. (5F,W,Sp,Su) ©

105. College Algebra. Real and complex number systems, graphs of functions, inverse functions, polynomial and rational functions, exponential and logarithmic functions, systems of equations, elementary matrix algebra. All students in this class must have a graphing calculator. Prerequisite: A grade of *C-* or better in Math 101, or a math ACT score of at least 23, or a satisfactory score on a placement exam. (5F,W,Sp,Su) ©

106. Trigonometry and Algebra. Trigonometric functions, equations, identities, and applications. Arithmetic and geometric sequences, binomial theorem, mathematical induction, permutations and combinations, and conic sections. All students in this class must have a graphing calculator. Prerequisite: A grade of *C-* or better in Math 105, or a math ACT score of at least 23, or a satisfactory score on a placement exam. (5F,W,Sp,Su) ©

SK 201, SK 202, 203. Mathematics for Elementary Teachers. Sets, logic, foundations of arithmetic and algebra, intuitive geometry, metrics, probability and statistics. Emphasis is on understanding the mathematics necessary to teach at the elementary school level. Prerequisites: ACT math score of 25 or higher or Math 105 is prerequisite to 201; 201 is prerequisite to 202; 202 is prerequisite to 203. (3F,W,Sp,Su) (3F,W,Sp,Su) (3F,W,Sp,Su)

215. Calculus Techniques. Techniques of elementary calculus of functions of one variable, including differentiation and integration, with applications to biological, management, and social sciences. Those wanting a deeper understanding of calculus should enroll in the Math 220, 221, 222 sequence. Prerequisite: Math 105. (3F,W,Sp,Su)

216. Calculus Techniques. Techniques from calculus of several variables including partial differentiation, multiple integration, optimization, and differential equations. Prerequisite: Math 215. (3F,W,Sp)

220, 221, 222. Calculus. Analytic geometry, differential and integral calculus, introduction to vectors, infinite series and applications. Those wishing to study upper-division mathematics should complete this sequence. All students in this sequence must have a graphics calculator (e.g. **TI 85**, **HP 48G**, or equivalent). Prerequisites: Math 105 and 106 or equivalent. Honors sections of 221 and 222 are taught as well; Honors Program approval is required. (5F,W,Sp,Su) (4F,W,Sp,Su) (4F,W,Sp,Su)

225. Introductory Internship/Co-op. An introductory-level educational work experience in mathematics in an internship/cooperative education position approved by the department. (1-6F,W,Sp,Su) ®

281. Topics in Mathematics (Topic). Topics in mathematics at the lower-division level. (1-5)

309. Methods of Secondary School Mathematics. A methods course required of all prospective secondary school mathematics teachers. Prerequisites: Math 311, 331; ScEd 301. (4F,Sp)

311, 312. Modern Geometry. A critical review of Euclidean geometry. Introduction to non-Euclidean geometries with emphasis on the historical significance of the parallel postulates. Projective geometry and transformations. Prerequisites: Math 221 and 331, or consent of instructor. (3W) (3Sp)

320. Multivariable Calculus. Vector functions, partial derivatives, multiple integrals, and line integrals. Prerequisite: Math 222. (4F,W,Sp,Su)

321. Introductory Linear Algebra. Topics from linear algebra including matrices, vector spaces, linear dependence and independence, bases, eigenvalues, eigenvectors, orthogonality, least squares, diagonalization, symmetric matrices, and linear transformations. Prerequisite: Math 222 or concurrent registration. (3F,W,Sp,Su)

322. Ordinary Differential Equations I. Techniques used in finding solutions of ordinary differential equations, emphasis on linear problems. Prerequisite: Math 321. (3F,W,Sp,Su)

331. Introduction to Discrete Mathematics. Logic and axiomatics, sets, functions, counting methods, recurrence relations, elementary combinatorics, graph theory, Boolean algebra. Prerequisites: Math 222 and CS 150 or equivalent. (3F,W,Sp)

384. Number Theory and History of Mathematics. Elementary properties of integers, arithmetical functions, congruences, and simple Diophantine equations; readings in the history of mathematics and an expository paper. Prerequisites: Math 221 and 331, or consent of instructor. (3W)

391. Readings and Conference. For prospective secondary school teachers. Registration requires prior arrangements with instructor. (1-4F,W,Sp,Su) ®

420. Foundations of Analysis. Fundamental concepts of analysis studied from a rigorous point of view. Emphasis on learning how to develop proofs. Prerequisites: Math 320 and 331. (3F,W,Sp)

422. Ordinary Differential Equations II. A second course in ordinary differential equations covering series solutions, linear systems, and qualitative behavior of two-dimensional autonomous systems. Prerequisite: Math 322. (3W)

425. Advanced Internship/Co-op. An internship/cooperative work experience which has been determined by the department to be at the 400-level. (1-6F,W,Sp,Su) ®

461. Numerical Methods. Survey of numerical methods. Nonlinear equations, systems of linear equations, polynomial interpolation, numerical integration and differentiation. Prerequisites: Math 322 and a working knowledge of a high-level programming language such as FORTRAN, PASCAL, or BASIC. (3W,Su)

462. Computer Aided Mathematics for Secondary Mathematics Teachers. Problem solving using symbolic manipulation software on computers. Topics in the undergradute Mathematics Education curriculum up through courses with emphasis on mathematics education are revisited and expanded using the software. Prerequisites: Math 321 and 322. (3F)

463. Computer Aided Mathematics for Scientists and Engineers. Problem solving using symbolic manipulation software on computers. Undergraduate mathematical concepts are revisited and extended through solution of science and engineering related problems. Prerequisites: Math 321, 322. (3Sp,Su)

471. Introduction to Probability. Introductory probability course focusing on intuitive understanding. Topics include discrete and continuous random variables, normal approximation, conditional probability, joint distributions, and many applications. Prerequisites: Math 320 and 321. (3W,Sp)

491. Readings and Conference. Registration requires prior arrangements with instructor. (1-4F,W,Sp,Su) ®

521, 522, 523. Advanced Calculus. One and several variable calculus from an advanced point of view, topology of Euclidean n-space, sequences of functions. Prerequisite: Math 420 or 551. (3F) (3W) (3Sp)

****527, 528, 529. Introduction to Complex Variables.** Basic theory and applications of complex variables for mathematics, physics, and engineering students. Analytic functions, contour integrals, conformal mappings, transform theory, special functions. Prerequisites: Math 320, 321, 322. (3W) (3Sp) (3Su) [4]

[1]See introductory paragraph, Placement of New Students. This course also requires extra fees.

531, *532, *533. Modern Algebra. *Fall quarter:* introductory group theory. *Winter and spring quarters:* rings, fields, and representations. Prerequisites: Math 320, 321, 322. (3F,Sp) (3W) (3Sp)

****534, 535. Linear Algebra.** Vector space theory, linear transformations and matrices, eigenvalues and eigenspace theory, inner product spaces, orthogonality, generalized eigenvectors, Jordan canonical form, minimal polynomial. Prerequisite: Math 531. (3W) (3Sp)

541. Methods of Applied Mathematics I. Dimensional analysis, Buckingham Pi theorem, regular and singular perturbation theory, boundary layer analysis, introduction to calculus of variations. Prerequisite: Math 322. (3F)

542. Methods of Applied Mathematics II. Classical methods for solution of partial differential equations, separation of variables, Fourier series, integral transforms, wave phenomena, continuum models, inverse problems, conservation laws. Prerequisite: Math 322. (3W)

543. Methods of Applied Mathematics III. Integral equations, stability and bifurcation analysis, and/or other topics. Prerequisites: Math 322 and 542. (3Sp)

546. Introduction to Theory and Application of Nonlinear Dynamical Systems. Understanding the long-term behavior of nonlinear dynamical systems as system parameters and initial states vary. Prerequisites: Math 321, 322. (3Sp)

****551, 552, 553. Introduction to Topology.** Elementary point set topology with emphasis on linearly ordered and metric spaces. Prerequisite: Math 222. (3F) (3W) (3Sp) [2]

****557, 558, 559. Actuarial Mathematics.** An introduction to the theory of risk and its application to the construction and analysis of models for insurance systems. Prerequisites: Math 471 or 571, and Stat 502. (3F) (3W) (3Sp) [2]

561. Numerical Analysis I. Direct solution of linear systems, Gaussian elimination with pivoting, Cholesky decomposition, GR factorization, power and GR methods for eigenvalues, solution of nonlinear scalar equations. Prerequisite: Math 321. (3F)

562. Numerical Analysis II. Newton methods for nonlinear systems, numerical differentiation, numerical quadrature, interpolation. Prerequisite: Math 561. (3W)

563. Numerical Analysis III. Numerical solution of ordinary and partial differential equations, shooting methods, finite differences. Includes initial and boundary value problems, stiff equations, and parabolic and elliptic PDE. Prerequisites: Math 322, 542, 561. (3Sp)

564, 565, 566. Applied Optimization. Theory and practical issues associated with algorithms for constrained and unconstrained optimization. Prerequisites: Math 320, 321, and 461 or equivalent. (3F) (3W) (3Sp) [2]

571. Theory of Probability. Basic mathematical theory of probability, discrete and continuous random variables. Prerequisites: Math 320, 321. (3F)

572, 573. Introduction to Mathematical Statistics. Basic mathematical theory of point estimation, interval estimation, hypothesis testing, and linear models. Prerequisite: Math 571. (3W) (3Sp)

***576, 577. Introduction to Stochastic Processes.** Application of stochastic processes to engineering and science. Topics include Markov chains, Poisson processes, renewal theory, and Brownian motion. Prerequisite: Math 571. (3W) (3Sp) [2]

581, 582, 583. Topics in Mathematics. Prerequisites: Math 320, 321, and 322. (1-5F) (1-5W) (1-5Sp) [2] ®

591. Readings and Conference. Registration requires prior arrangements with instructor. (1-4F,W,Sp,Su) ®

595H. Honors Senior Project. A senior project, required for completion of the departmental honors program and developed under the direction of a departmental faculty member. Prerequisite: Math 522. (1-4F,W,Sp)

Graduate[3]

600. Graduate Internship/Co-op. (1-6F,W,Sp,Su) ®

****611, 612, 613. Differential Geometry.** (3) (3) (3) [2]

621, 622, 623. Real Analysis. (3) (3) (3) [2]

***631, 632, 633. Modern Algebra.** (3) (3) (3) [2]

****634, 635, 636. Matrix Theory and Linear Algebra.** (3) (3) (3) [2]

***641, 642, 643. Ordinary Differential Equations.** (3) (3) (3) [2]

****644, 645, 646. Partial Differential Equations.** (3) (3) (3)[2]

***651, 652, 653. Topology.** (3) (3) (3) [2]

661, 662, 663. Numerical Analysis. (3) (3) (3) [2]

664, 665, 666. Optimization. (3) (3) (3) [2]

***671, 672, 673. Probability Theory.** (3) (3) (3) [2]

681, 682, 683. Topics in Mathematics (Topic). (3) (3) (3) ®

697. Thesis. (1-9) ®

699. Continuing Graduate Advisement. (1-3) ®

711, 712, 713. Topics in Geometry. (3) (3) (3) [2] ®

721, 722, 723. Topics in Analysis. (3) (3) (3) [2] ®

731, 732, 733. Topics in Algebra. (3) (3) (3) [2] ®

741, 742, 743. Topics in Differential Equations. (3) (3) (3) [2] ®

751, 752, 753. Topics in Topology. (3) (3) (3) [2] ®

761, 762, 763. Topics in Numerical Analysis. (3) (3) (3) [2] ®

764, 765, 766. Topics in Optimization. (3) (3) (3) [2] ®

771, 772, 773. Topics in Probability and Statistics. (3) (3) (3) [2] ®

780. Seminar. (1-3) ®

781, 782, 783. Topics in Mathematics. (3) (3) (3) [2] ®

785, 786, 787. Topics in Applied Mathematics. (3) (3) (3) [2] ®

791. College Teaching Internship. (3) ®

797. Dissertation Research. (1-15) ®

799. Continuing Graduate Advisement. (1-3) ®

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*Taught 1996-97.

**Taught 1997-98.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

[2]Not all courses are offered each year. Check with the department for current offerings.

[3]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*. These courses are generally not offered every year.

[4]Math 529 will be taught only if there is sufficient demand.

Statistics Courses

SK 201. Introduction to Statistics. Descriptive and inferential statistical methods are introduced. The emphasis is on conceptual understanding and statistical thinking. Examples from many different areas of interest are given. Prerequisite: Math 101. (4F,W,Sp,Su) ©

225. Introductory Internship/Co-op. Introductory educational work experience. (1-6F,W,Sp,Su) ®

230. Business Statistics. Descriptive and inferential statistics, probability, sampling, estimation, tests of hypotheses, linear regression and correlation, chi square, analysis of variance, time series, index numbers. Prerequisite: Math 105. (5F,W,Sp,Su) ©

301. Statistical Methods I. Introduction to statistical concepts, graphical techniques, probability distributions, estimation, and testing. Prerequisite: Math 105; Math 215 or 220 recommended. (3F,W,Sp,Su) ©

425. Advanced Internship/Co-op. Advanced educational work experience. (1-15F,W,Sp,Su) ®

491. SPSS Shortcourse. Access to and use of the SPSS statistical analysis program. (1)

492. SAS Shortcourse. Access to and use of the SAS statistical analysis program. (1)

495. Directed Reading. (1-5)

502. Statistical Methods II. Differences between means and proportions, chi-square tests, linear regression, analysis of variance, and mean comparisons. Prerequisite: Stat 301 or equivalent. (3F,W,Sp,Su)

503. Statistical Methods III. Two-way and three-way analyses of variance, covariance, and multiple regression. Prerequisite: Stat 502. (3W)

505 (d605).[4] Linear Regression. Methods for prediction and hypothesis testing in multivariate linear models, including analysis of variance and covariance. Statistical software for regression and ANOVA. Prerequisite: Stat 502 or 230. (3Sp)

508. Statistical Process Control. Techniques and applications of statistics in modern management of industrial processes. Control charts, acceptance sampling. Design of

industrial experiments and analysis of process failures. Prerequisite: Stat 201 or 301. (3Sp)

***510. Sampling.** Random sampling, sampling for proportions, stratified sampling, cluster sampling. Emphasis will be placed on applications. Prerequisite: Stat 502. (3W)

***515. Categorical Data Analysis.** Analysis of categorical data. Contingency tables; goodness of fit; work of Goodman, Kullback; Markov chains; use of computer programs. Prerequisite: Stat 503 or 505/605. (3F)

520. Design of Experiments. The design, analysis, and interpretation of experiments, especially factorials, split plots, incomplete blocks, confounding, fractional factorials, and nested designs. Prerequisite: Stat 503 or equivalent. (3Sp)

****542. Applied Time Series.** An introduction to time series analysis and signal processing. Topics include trend analysis, ARIMA models, seasonal models, forecasting, spectral analysis, and filtering. Prerequisite: Stat 503 or 505/605. (3W)

****560. Applied Multivariate Statistics.** An introduction to multivariate statistical procedures for data analysis. Topics include MANOVA, principal components analysis, factor analysis, discriminant analysis, clustering, and classification. Prerequisite: Stat 503 or Stat 505/605. (3F)

581, 582, 583. Topics in Statistics. Prerequisite: Stat 502. (1-5F) (1-5W) (1-5Sp)[2] ®

595H. Honors Senior Project. A senior project, required for completion of the departmental honors program and developed under the direction of a departmental faculty member. Prerequisite: Stat 503. (1-4F,W,Sp)

597. Seminar. Review of current literature and developments in the field of statistics. (1-3) ®

Graduate[3]

601, 602, 603. Mathematical Statistics: Theory and Application. (3F) (3W) (3Sp)

605 (d505). Linear Regression. (3Sp)

****615. Nonparametric Statistics.** (3F)

****616. Reliability.** (3W)

****617. Robust Methods in Statistics.** (3Sp)

625. Graduate Internship/Co-op. (1-12)

***634. Analysis of Unbalanced Data.** (3F)

***635, 636. Linear Statistical Models.** (3W) (3Sp)

***642. Time Series.** (3Sp)

***660, 661. Multivariate Analysis.** (3F) (3W)

675. Practical Statistical Consulting. (2)[2] ®

681, 682, 683. Topics in Statistics. (3F) (3W) (3Sp)[2] ®

695. Readings and Reports. (3-6) ®

697. Thesis and Research. (1-9) ®

699. Continuing Graduate Advisement. (1-3) ®

701, 702, 703. Topics in Mathematical Statistics. (3F) (3W) (3Sp) ®

704, 705, 706. Topics in Decision Theory. (3F) (3W) (3Sp) ®

720, 721, 722. Topics in Experimental Design. (3F) (3W) (3Sp) ®

734, 735, 736. Topics in Statistical Modelling. (3F) (3W) (3Sp) ®

751, 752, 753. Topics in Computational Statistics. (3F) (3W) (3Sp) ®

760, 761, 762. Topics in Multivariate Statistics. (3F) (3W) (3Sp) ®

797. Dissertation Research. (1-15) ®

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*Taught 1996-97.

**Taught 1997-98.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

[1]Parenthetical numbers preceded by a *d* indicate a *dual* listing.

[2]Not all courses are offered each year. Check with the department for current offerings.

[3]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

Department of
Mechanical and Aerospace Engineering

College of Engineering

Head: Professor Frank J. Redd
Office in Engineering Laboratory 178, 797-2867

Professors J. Clair Batty, P. Thomas Blotter, Ralph H. Haycock, Russell M. Holdredge, Alma P. Moser (Associate Dean, College of Engineering), Warren F. Phillips, Edward W. Vendell, Jr.; **Professors Emeritus** Owen K. Shupe, W. Karl Somers, Carl D. Spear; **Adjunct Professors** Dell K. Allen, Larry H. Brim, Robert H. McEntire, David G. Norton; **Associate Professors** Steven L. Folkman, Thomas H. Fronk, R. Rees Fullmer; **Adjunct Associate Professor** Don G. Ferney; **Assistant Professor** Christine E. Hailey

Degrees offered: Bachelor of Science (BS), Master of Science (MS), Master of Engineering (ME), and Doctor of Philosophy (PhD) in Mechanical Engineering

Objectives

The Department of Mechanical and Aerospace Engineering (MAE) offers the Mechanical Engineering Program, the Manufacturing Engineering Program, and the Aerospace Engineering Option.

The mission of the Mechanical and Aerospace Engineering Department is to produce superior graduates who are qualified and prepared for challenging and rewarding professional careers in mechanical engineering, manufacturing engineering, or aerospace engineering.

The **Mechanical Engineering** Program forms the nucleus for all three areas of emphasis in the department. The manufacturing engineering program and the aerospace engineering option are built on a strong foundation of mechanical engineering fundamentals. These fundamentals are centered on the study of energy, including its conversion to more useful forms, its transmission to needed locations, and its utilization; and on the study of mechanical systems, their structures, and their motion. Mechanical Engineering graduates are prepared to pursue careers in such widely diverse industries as aerospace, agricultural equipment, automotive, composite materials, biotechnical, electrical utilities, food processing, industrial equipment, manufacturing, materials, nuclear, petroleum, robotics, and solar energy.

The **Manufacturing Engineering Program** serves to focus mechanical engineering fundamentals on the study of manufacturing processes and materials, process and product engineering, productivity and quality, and the design of manufacturing systems. Areas of emphasis include automated processes and computer aided manufacturing.

Aerospace Engineering serves to focus mechanical engineering fundamentals on the mechanics and dynamics of flight within the atmosphere and space flight. Included within its scope are studies in aerodynamics, aircraft flight dynamics and control, spacecraft orbital motion, spacecraft attitude motion and control, and space systems design. Graduates who complete the Aerospace Option are prepared to pursue careers in aircraft and/or spacecraft design and development, rocket and turbine propulsion systems, aircraft flight testing, and space trajectory design/analysis.

With further training, many MAE graduates seek interdisciplinary careers in such areas as medicine, environmental engineering, law, consulting, and business management.

The overall curricular objective of the MAE Department is to provide an educational experience integrating the basic fundamentals of mathematics, basic science, and engineering science with appropriate laboratory and engineering design activities to develop graduates who are able to (1) identify and characterize practical problems within their areas of specialization and (2) apply their skills to the design and development of mechanical systems providing solutions to those problems. The curriculum is also designed to provide a strong background in the humanities and social sciences, in order to equip graduates with an understanding of the societal background within which they will pursue their profession.

The first two years of the MAE curriculum structure concentrate on the fundamentals of mathematics, physics, computer programming, and basic engineering. During the second two years, students apply these fundamentals to more concentrated courses in the essentials of mechanical, manufacturing, and/or aerospace engineering. Laboratory activities are integrated into the curriculum as separate courses and as exercises within nonlaboratory courses to give students opportunities for hands-on exposure to real hardware. Engineering design activities begin during the first two years and progress in depth as the student's proficiency increases. The engineering design experience culminates in a major senior design course integrating past engineering coursework into a focused, realistic design project.

The Mechanical Engineering and the Manufacturing Engineering programs are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET). The Aerospace Engineering Option is integrated into the Mechanical Engineering Program.

Admission and Graduation Requirements

Freshman and transfer students must satisfy admission policies and entrance requirements of both the University and the College of Engineering. Each new student will be assigned an adviser, who will help plan an educational program fulfilling the student's professional goals.

Placement of New Students. Placement of incoming students will depend on high school and/or prior college coursework. Those who complete a portion of the General Education requirements by examination (CLEP) and/or by advanced placement (AP) credit may complete the requirements for a Bachelor of Science degree in less than four years.

Curriculum. At the beginning of each school year, **each student should obtain a detailed, four-year requirement sheet.** This sheet, which lists quarterly requirements for each of the three curricula, may be obtained from the departmental office. All students in the department follow the preprofessional engineering curriculum for the freshman and sophomore years. Prior to the junior year, the student will apply for admission to the professional program and, in consultation with the faculty adviser, select an area of emphasis. Students who are unable to take courses during the quarter indicated on the curriculum requirement sheet may develop alternative schedules, consistent with prerequisites and the timing of course offerings.

A passing grade on the Fundamentals of Engineering Exam, the first step in becoming a licensed professional engineer, is required for graduation. Past experience has shown that the USU Mechanical and Aerospace Engineering students are well-prepared for this locally administered, national exam.

For additional information on academic requirements, see the College of Engineering and the Undergraduate and Graduation Requirements sections of this catalog.

Financial Support

Scholarships, assistantships, grants-in-aid, and work study programs are available through the University. In addition, the department employs students to assist in engineering research and development. Buried structures, design of instrumentation and payloads for the upper atmosphere and space, and manufacturing processes and control are some of the research programs that involve students. Cooperative education and industrial employment opportunities for students are coordinated by the University Placement Office.

Graduate Study

The department offers the Master of Science and Doctor of Philosophy degrees, based on a strong graduate curriculum and major research programs in applied mechanics, space systems engineering, buried structures, and manufacturing processes and control. For further information, see the *Graduate Catalog*.

Mechanical and Aerospace Engineering Courses

170. Engineering Graphics. Technical drawing, descriptive geometry, and computer graphics. Computer graphics used to teach engineering drafting, dimensioning and tolerancing, and geometric design. One lecture, two labs. Prerequisite: Math 106. (3F,W,Sp)

188. Engineering Orientation and Computer Applications. Orients students to College of Engineering programs, academic advising, student services, professional societies, and engineering careers. Laboratory activities emphasize writing and computer applications. Prerequisites: Math 106 and keyboarding at 25 WPM. (1W,Sp)

211. Manufacturing Operations—Fundamentals. Introduction to manufacturing processes with emphasis on theory and practice of material-removal. Survey of other topics including casting, extrusion, forming, quality, and automation. Prerequisite: Sophomore-level standing. (5F,Sp)

IO 216. Energy. A study of energy resources, utilization, conversion, and conservation. Social impacts of energy resource development including public policy and planning. (3)

225. Cooperative Practice. A planned work experience in industry. Detailed program must have prior approval. Written report required. (3F,W,Sp,Su) ®

276. Computer-assisted Design. Fundamentals of computer-assisted engineering design and computerized engineering graphics; includes design project. Prerequisites: Engr 103, 204, MAE 170, and Math 221. (3F,Sp)

331. Thermodynamics. Energy and entropy concepts, irreversibility and availability, ideal gas mixtures, psychrometrics, cycles—gas, vapor, and refrigeration. Prerequisites: Engr 330 and MAE 276. (3W)

336. Heat Transfer. Analytical and numerical studies of how energy is transferred by conduction, convection, and radiation. Prerequisite: MAE 355. (5Sp)

339. Thermal/Fluids Laboratory. Provides students with experience in observation and measurement of fundamental thermal fluid phenomena. Prerequisites: MAE 336 and 371. Two labs. (3Sp)

354. Fluid Transport Theory I. Application of fluid transport theory to inviscid and viscous, incompressible and compressible, external and internal fluid flows, with an

emphasis on laminar and turbulent boundary layers. Prerequisites: MAE 276, Engr 330 (concurrent), and Engr 203. (3F)

355. Fluid Transport Theory II. Continuation of MAE 354. Prerequisites: Engr 330 and MAE 354. (3W)

371. Instrumentation and Experimentation. Principles and applications of mechanical instrumentation and experimentation. Sensing elements, signal conditioning, read out devices, data reliability, and instrumentation system design. Two lectures and one lab. Prerequisites: Engr 204, ECE 270, 271. (3F)

415. Material Science. Engineering properties of metals, alloys, ceramics, plastics, and composite materials. Emphasis given to material selection for proper engineering design. Three lectures, one lab. Prerequisites: Phyx 223, Chem 122. (4F)

424. Dynamic Systems and Controls. Modeling the dynamic response of mechanical, electro-mechanical, hydraulic, and pneumatic systems. Introduction to classical feedback control systems with emphasis on stability analysis and design fundamentals. Three lectures. Prerequisite: MAE 371. (3W)

471. Kinematic Design. Computer-aided engineering design of mechanisms; linkages; cams; gears; gear trains; synthesis of mechanisms. Prerequisites: Engr 203, MAE 276. (3F)

472. Design of Machine Elements. The design and synthesis of machines and mechanisms, mechanical linkages, fasteners, power transmission, gears, bearings, and lubrication. Three lectures, one lab. Prerequisites: CEE 305, MAE 471. (4W)

487. Design Project. Students plan and complete initial stages of the design project(s) which will be completed winter quarter in MAE 488. One lab. Prerequisites: CEE 305; MAE 336; MAE 415 and 471 concurrently. (1F)

488. Design Project. Completion of design project(s). Students must take MAE 488 the winter quarter following completion of MAE 487. Two labs. Prerequisites: MAE 487; MAE 472 concurrently. (3W)

489. Design Project. Students complete design projects and prepare final documentation. Prerequisite: MAE 488. (1Sp)

493. Special Problems. Formulation and solution of practical or theoretical problems. Prerequisite: permission of department head. (3) ®

501. Finite Element Methods in Solid Mechanics. Introduction to finite element methods and their application to the analysis and design of mechanical engineering systems. Three lectures. Prerequisites: CEE 305, Math 321. (3W)

502. Mechanical Vibrations. Free, damped, and forced linear vibrations of discrete systems. Prerequisite: Engr 203. (3Sp)

503. Orbital Mechanics. Classical two-body orbital mechanics, orbit determination, basic orbital maneuvers, time of flight, lunar and interplanetary trajectories, and perturbation methods. Prerequisite: Engr 203. (3F)

504. Advanced Mechanics of Materials. Advanced strength of materials and elementary elasticity principles, including stress analysis, nonsymmetric bending of beams, thin-walled structures, torsion, and energy methods. Prerequisite: CEE 305. (3F)

508. Mechanics of Composite Materials. Stress-strain relations for nonisotropic composites, such as fiber-reinforced plastic laminates, properties and their uses, strength and life determination, and methods for design using composite materials. Prerequisite: CEE 305. (3F)

***509. Spacecraft Attitude Dynamics.** Focus will include dynamics of a system of particles; angular momentum and moments; rigid body motion; gyroscopic instruments; spacecraft attitude motion; and spacecraft attitude control. Prerequisites: MAE 424 and 503. Instructor's consent required for undergraduate students. (3Sp)

***513. Principles of Numerical Control.** Product design analysis for N/C application. Selection, justification, application, and implementation of N/C equipment. Operational planning, manual, and computer-aided programming for N/C. Prerequisites: MAE 211, 276. (3F)

514. Material Science. Emphasis on mechanics, behavior, and chemistry of polymers. Topics include polymer properties, selection criteria, manufacturing methods, and design methods, including viscoelastic behavior, wear characteristics, and nonlinear stress-strain relations. Prerequisite: MAE 415 or instructor's consent. (3Sp)

****521. Computer Control of Machines and Processes.** Computer fundamentals, interface electronics, and microprocessor utilization pertaining to manufacturing engineering. Three lectures. Prerequisites: MAE 211 and 424. (3W)

****522. Integrated Manufacturing Systems.** Computer applications in the integration of computer-aided design, computer-aided manufacturing, and manufacturing resource planning. The nonprocess control aspects of CAM will be emphasized. Prerequisite: MAE 211. (3Sp)

****523. Robotics.** Overview of robotics as a manufacturing technology, applications, geometrics and kinematics of five and six axis robots, tooling and assembly operations, programming and control. Prerequisite: Engr 203. (3F)

525. Hydraulics and Pneumatics. Fluid power and controls as applied to machine tools. Prerequisite: MAE 355. (3Sp)

***527. Quality Control.** Quality control techniques and systems for industry. Prerequisite: MAE 211. (3Sp)

531. Thermal Systems Design. Cycles, chemical reactions, introduction to design optimization, design projects. Prerequisites: MAE 331 and 336. (3Sp)

532. Thermal Environmental Design. Air conditioning and heating, solar utilization, thermal environmental control, laboratory exercises, design project. Prerequisites: MAE 331, 355. Must be taken concurrently with MAE 336. (3Sp)

540. Aerodynamics. Dynamics of an incompressible, inviscid flow field; characteristic airfoil parameters; incompressible flow around two-dimensional airfoils and finite wings; supersonic aerodynamics. Prerequisite: MAE 355. (3W)

***541. Dynamics of Flight in the Atmosphere.** Scope includes the development of equations of motion for flying vehicles; aerodynamic forces and moments; longitudinal, lateral, and roll motion; stability; and qualitative flight analysis. Prerequisite: MAE 540. (3Sp)

****545 (d645).[1] Direct Energy Conversion.** Intrinsic and extrinsic semiconductors; thermoelectric, photovoltaic, and thermionic generators; magnetohydrodynamic power generation; fuel cells. Prerequisites: senior engineering status or instructor's consent. (3)

547. Internal Combustion Engines. Thermodynamics of internal combustion engines; idealized cycles, fuels, fuel metering, engine characteristics, pressure measurement, and engine testing. Prerequisite: MAE 331. (3Sp)

554. Gas Dynamics. Application of conservation of mass, momentum, and energy to the design and analysis of compressible fluid systems. Prerequisites: MAE 331, 355. (3F)

***575. Control System Design.** Design and analysis of control systems using classical design techniques for both single and multiple loop systems. Case study reviews. Three lectures. Prerequisite: MAE 424. (3Sp)

***576. Production Tool Design.** Design of special tooling, jigs, and fixtures for economical production. Emphasis placed on predesign analysis, cutting force analysis, locating, positioning, and clamping requirements. Prerequisites: MAE 211, 276, CEE 305. (3W)

585. Space Systems Design I. Introduction to space mission and vehicle design. Prepares students for the formal space system design activities that follow in MAE 586 and 587. Multidisciplinary. Prerequisite: junior level or above in Science or Engineering. (1F)

586. Space Systems Design II. Multidisciplinary systems design course focused upon the detailed design of a spacecraft. Prerequisite: MAE 585 or instructor's permission. Must commit to MAE 587. (3W)

587. Space Systems Design III. Multidisciplinary space systems design course. Completes the design activity in MAE 586. Culminates in a formal Critical Design Review. Prerequisite: MAE 586. (2Sp)

590. Cooperative Practice. A planned work experience in industry. Detailed program must have prior approval. Written report required. Student must be in professional program. (3) ®

Graduate[2]

600. Advanced Dynamics. (3Sp)

602. Mechanical Vibrations. Prerequisite: MAE 502 or instructor's consent. (3)

604. Continuum Mechanics. Prerequisite: CEE 305 or instructor's consent. (3)

605. Elastic Theory. Prerequisite: MAE 604 or instructor's consent. (3)

606. Plasticity Theory. Prerequisite: MAE 604 or instructor's consent. (3)

607. Advanced Astrodynamics. Prerequisite: MAE 503. (3Sp)

608. Advanced Mechanics of Composite Materials. Prerequisite: MAE 508. (3)

617 (f517). Ceramics and Plastic Materials. Prerequisite: MAE 415. (3)

621. Manufacturing Simulation and Optimization. Prerequisite: MAE 521. (3)

623. Robotics. Prerequisite: MAE 523. (3)

***630, 631. Thermodynamics.** Prerequisites: MAE 331 or instructor's consent is prerequisite to 630; MAE 630 or instructor's consent is prerequisite to 631. (3F) (3)

635. Transport Phenomena. Prerequisite: MAE 336. (3)

636. Convective Heat and Mass Transfer. Prerequisite: MAE 336. (3)

637. Conductive Heat Transfer. Prerequisite: MAE 336. (3)

638. Radiation Heat Transfer. Prerequisite: MAE 336. (3)

642. Aeroelasticity. Prerequisite: MAE 540. (3F)

****645 (d545). Direct Energy Conversion.** (3)

646. Solar Energy Systems. (3)

652. Viscous Fluid Flow. Prerequisite: MAE 540 or CEE 657. (3Sp)

***655. Space Rocket Propulsion.** Prerequisite: MAE 554. (3W)

****656. Aircraft Propulsion Systems.** Prerequisite: MAE 554. (3W)

****657. Potential Fluid Flow.** Prerequisites: CEE 351 or MAE 355. (3W)

658. Computational Fluid Dynamics. Prerequisites: MAE 540, 554, or instructor's consent. (3F)

672. Finite Element Methods in Solid Mechanics II. Prerequisite: MAE 501. (3)

676. Hydraulic Transients. Prerequisites: CEE 351 or MAE 355. (3Sp)

693. Special Problems. (1-3) ®

695. Design Project. (3)

697. Thesis Research. (1-9) ®

699. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

702. Mechanical Vibrations. Prerequisite: MAE 602. (3)

705. Elastic Theory. Prerequisite: instructor's consent. (3)

731. Engineering Thermodynamics. (3W)

735. Special Topics in Heat Transfer. Prerequisites: MAE 636 and 638. (3Sp) ®

736. Computational Heat Transfer. Prerequisites: MAE 635, 636, 637, 638. (3Sp)

753. Advanced Control Theory. Prerequisite: ECE 653 and instructor's consent. (3Sp)

758. Advanced Finite Element Analysis. (3Sp)

793. Special Problems. (1-3) ®

797. Dissertation Research. (1-12) ®

799. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing; parenthetical numbers preceded by an *f* are the *former* course numbers.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

*Taught 1996-97.

**Taught 1997-98.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Department of
Military Science
College of Humanities, Arts and Social Sciences

Head: Professor MAJ Patrick J. Malherek
Office in Military Science 104, 797-0609

Assistant Professors MAJ Reed Critchfield, CPT Warren T. Daniel, CPT Edward L. Lyman

Objectives

The departmental objective is to commission the future officer leaders of the United States Army, Army Reserve, and Army National Guard concurrently while they obtain baccalaureate degrees.

Requirements

1. Admission

a. Courses offered by the department are open to all students and do not generally carry prerequisites; students are encouraged to meet with the specific instructor prior to enrollment.

b. Students desiring to officially enroll in the ROTC program (leading to a commission as an Army officer) must meet eligibility requirements specified by Army regulations; interested students should inquire at the Administrative Office, Military Science 104.

2. Leadership Workshop

a. Those students officially enrolled in the ROTC program must participate in the leadership workshop program concurrently with the core academic course sequence.

b. A quarterly lab fee of $10 is required of all students enrolled in the Basic Course. The quarterly lab fee for cadets in the Advanced Course is $10.

3. Commission Requirements. To be commissioned in the U.S. Army, a student must:

a. Qualify for entrance into the Advanced Course.

b. Complete the University requirements for at least a baccalaureate degree.

c. Complete the required on-campus Military Science courses (MS 301, 302, 303, 308, 314, 315, 316, 401, 402, 403, 414, 415, 416). Students must have six quarters of ROTC contact hours while enrolled in the Advanced Course.

d. Successfully complete a **six-week** ROTC Advanced Camp.

e. Meet current commissioning standards (i.e., physical, medical, academic, etc.).

f. Successfully complete courses in the following academic subject areas: written communication skills, human behavior skills, military history, math, and computer science.

Special Programs

1. Two-year Program. Those students who are unable to fulfill the requirements of the traditional four-year program may be accepted into the third year of military science upon completion of a special six-week basic ROTC summer camp. The camp can be taken for course credit, and students are paid by the Army.

2. Advanced Placement. Students with prior military service or ROTC training (junior or senior) may be awarded advanced placement at the discretion of the department head.

3. Compressed Military Science Basic Course. The two-year Basic Course may be compressed at the discretion of the student and professor of military science. The minimum requirement for Basic Course is completion of 90 contact hours with the Military Science Department. Students must have two years remaining at the University to complete the military science Advanced Course.

4. Financial Aids. Army ROTC cadets will receive $150 per month allowance during their last two years of ROTC. Cadets are also paid approximately $700 and are provided free room, board, and an airplane ticket to and from Advanced Camp. Students attending Basic Camp are paid by the Army.

5. Army ROTC Scholarships. Full scholarships are available to enrolled cadets through a competitive process stressing academic achievement and motivation for a career in the service. Scholarships pay full tuition, an allocation for books and academic fees, plus up to $1,500 per school year while the cadet is completing the ROTC program. USU also offers dormitory rooms at $400 off per quarter to scholarship students.

6. Delay of Entry on Active Duty. Graduates of the ROTC program need not enter the service immediately upon being commissioned. Graduates may enter the Army between graduation day and 1 June following graduation and commissioning, depending on the individual's preference and the needs of the service. Those who have been accepted for graduate study may delay their active service pending the completion of advanced degrees.

7. Duty with Reserve Components. Graduates of the Army ROTC program may request duty with the Army Reserve or Army National Guard. These requests will be accepted based on the needs of the active Army and the Reserve/National Guard. This option allows the graduate to continue his or her civilian career while serving as a citizen soldier.

8. Simultaneous Membership Program (SMP). Students may elect to simultaneously enroll in the Army ROTC and the National Guard or Army Reserve. This will allow the student to maximize the financial benefits and receive leadership experience and benefits of service in the Reserves or National Guard.

9. Academic Minor in Military Science. The Military Science Department will offer a minor based on completion of the commissioning requirements listed above. This minor must be coordinated through the student's major college. A student need not be commissioned to receive a minor in Military Science.

Extracurricular Activities

The following activities are supported by the Military Science Department with a view toward enrichment of the ROTC program:

Rangers. An organization open to any USU student who has a special interest in field operations. Activities include survival training, mountain climbing, cross-country skiing, and extensive tactical and physical training beyond the scope of the regular ROTC program.

Color Guard. An organization responsible for the presentation of our National Colors during University events. In order to participate, members devote extra hours perfecting drill and ceremony skills.

Military Science Courses

101. Introduction to Military Science and Leadership I. Introduction to military science and leadership, acquainting the student with the United States Army ROTC program. (2F,W Sp)

102. Introduction to Military Science and Leadership II. Builds on the introduction given in MS 101. Emphasis on the role of the officer and on the role of the Army. Prerequisite: MS 101. (2F,W,Sp)

110. Rifle Marksmanship. Instruction and practical application of rifle marksmanship using small bore rifles, range, and rules as a medium. Lab fee: $10. (1F,W,Sp) ®

111, 112, 113. Rangers. Basic instruction and training includes intense physical conditioning, military skills proficiency, tactical field exercises under all weather conditions, and classroom instruction/practical exercise in the conduct of Ranger Tactical Operations. (1-5F) (1-5W) (1-5Sp)

114. Leadership Workshop. Practical training in skills useful in military and civilian environment. Emphasis is on outdoor training and related skills. (1F,W,Sp)

115. Map Reading/Orienteering. Orienteering is a timed cross country race. Includes use of topographic maps and compass. Opportunity is provided for participation in at least one local meet. (2) ®

201. Fundamentals of Leadership and Management. Introduction and application of the fundamentals of leadership and the concepts of management. (2F,W,Sp)

202. Survival Techniques. Introduces basic survival first aid techniques. Emphasis on survival planning to include the use of plants and wildlife in all regions and climates. (2W,Sp)

205. Basic Seminar Problems. A readings and conference approach to military history. Students research and prepare projects approved by the instructor. (1-3F,W,Sp,Su)

206. Basic ROTC Summer Camp. Training in military skills, leadership experience, physical fitness, and introduction to the U.S. Army. Six weeks of training conducted at an Active Army Post. Completion qualifies the student to enter the Advanced ROTC Program. (6Su)

214. Leadership Workshop. Practical training in skills useful in military and civilian environment. Emphasis is on outdoor training and related skills. (1F,W,Sp)

301. Fundamentals of Land Navigation and Squad Tactics. Instruction on reading topographic maps, land navigation, and an introduction to the military use of terrain. (2F)

302. Principles of Military Operations I. Includes squad and platoon tactics, operations orders, and patrolling techniques. (3W)

303. Principles of Military Operations II. Includes advanced platoon tactics, patrolling, and FM communications. (2Sp)

305. Advanced ROTC Summer Camp. Six weeks of advanced training and experience in military skills, leadership and management, physical fitness, and Army job opportunities. Training is conducted at an Active Army Post. (10Su)

306, 307. Physical Conditioning. Individualized conditioning program designed to prepare a person to meet or exceed the Army Conditioning Standards and prepare the student for MS 308. (2F,Su) (2W) ®

308. Physical Readiness Training. Army Physical Readiness Training System including testing, evaluation, planning, leadership, and physical conditioning. Mandatory prior to attendance at Advanced Camp. (2Sp) ®

311, 312, 313. Rangers. Advanced instruction and training includes intense physical conditioning, military skills proficiency, tactical field exercises under all weather conditions, and classroom instruction/practical exercise in the conduct of Ranger Tactical Operations. Prerequisite: completion of basic Rangers courses, MS 111, 112, and 113. (1-5F) (1-5W) (1-5Sp)

314, 315, 316. Leadership Workshop. Practical training in leadership and advanced military skills taught in a field environment. (1F) (1W) (1Sp)

401. Leadership and Management. Functional theories of leadership with realistic practical exercise in counseling, management, and leadership problem solving. (2F)

402. Armed Forces and Society: Professional Issues. Military sociology, professionalism and ethics, military manpower and personnel policies, and current politico-military issues. (2W)

403. Military Law and Service Orientation. Introduction to military law, personnel management system, and practical orientation to service life. (2Sp)

405. Advanced Military Science Seminar Problems. A readings and conference approach to the study of military history. Students will research an approved subject, prepare a written paper, and make an oral presentation. (1-3F,W,Sp,Su)

414, 415, 416. Leadership Workshop. Practical application in leadership management skills and methods of instruction. (1F) (1W) (1Sp)

420. Advanced Military Staff Skills. Staff skills required for future officers. Military science cadets learn a wide range of leadership and managerial skills, which can be applied to the practical problems facing the staff officer in the military organization. (1-3F,W,Sp)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Department of
*Music**

College of Humanities, Arts and Social Sciences

Head: Associate Professor Bruce M. Saperston
Office in Fine Arts Visual 129, 797-3000

Professors Gary Amano, Michael L. Ballam, Warren L. Burton, Michael K. Christiansen, Willard R. Kesling, F. Dean Madsen, Larry G. Smith; **Professors Emeritus** Max F. Dalby, Glen A. Fifield, Alvin Wardle, Irving Wassermann; **Associate Professors** James M. Drake, Mark A. Emile, Dennis D. Griffin; **Associate Professor Emeritus** Mildred Johnson; **Assistant Professors** Betty Beecher, John Cody Birdwell, Todd L. Fallis, Nicholas E. Morrison, Elizabeth York; **Lecturers** Bonnie Slade, Leslie Timmons; **Music Therapy Clinical Instructor** Desiree M. Donich

Degrees offered: Bachelor of Arts (BA) and Bachelor of Music (BM) with emphases in Music Education, Performance, and Piano Pedagogy; BA and BS in Music Therapy; Master of Education (MEd) in Secondary Education with emphasis in Music

Objectives

The Department of Music provides instruction in music by; (1) offering service courses which contribute to the Liberal Arts and Sciences Program of the Colleges of HASS and Science, and to the General Education program of the University; (2) offering specific sequences of courses leading to professional preparation in music education, music therapy, and performance/pedagogy; and (3) providing public musical service to the University and community.

The specific objectives of the programs in music for the music major are fourfold: (1) to prepare certified music teachers to serve effectively in elementary and secondary schools; (2) to prepare musically talented students for careers as professional performers and/or studio teachers; (3) to prepare registered music therapists to serve in educational and therapeutic settings; (4) to prepare music students for graduate study in their area of specialization.

Requirements

Departmental Requirements

Departmental Admission Requirements. Admission requirements for the Department of Music include those described for the University on pages 8-11. In addition, transfer students must have a 3.00 GPA in music courses and a 2.75 overall GPA. Students in good standing, as well as transfer students meeting transfer requirements, may apply for admission to the department. In addition, to enter the Music Department, as a major in music education, music performance, piano pedagogy, or music therapy, it is necessary that a student meet with his/her adviser for an audition/interview.

It is strongly recommended that prospective majors complete their audition/interview during Music Department scholarship auditions in the January preceding admission to USU. To schedule an audition/interview, contact the Music Department Scheduling Assistant at (801) 797-3015.

*USU's Music Department is accredited by the National Association of Schools of Music.

Prospective majors in **music therapy** should complete the audition/interview before the first of June of the year of admission. Audition/interviews, however, continue to be scheduled after these dates.

Recital and Concert Attendance. Recital and concert attendance is required and will be monitored. To keep track of attendance, students are asked to sign the program of the recital or concert being attended, and to turn the program in to the Music Department Office after the performance. These records will become part of the student's official file.

To graduate, students are required to attend a minimum of nine recitals and nine concerts each school year.

Individual Performance Requirement and Jury Exams. Every music major, with the exception of the music therapy major, is expected to take individual voice or instrumental instruction each quarter and to practice individually on a regular basis. To measure progress in individual performance, jury examinations are held quarterly.

Recital Participation. Each music education, performance, and pedagogy major is encouraged to appear in a department-sponsored student recital at least once each quarter and is **required** to perform in at least four recitals before graduation. The adviser determines whether the student fills the requirement as a soloist, a member of a **small** ensemble, or as an accompanist.

Senior Recitals. All students majoring in performance will present a full-length senior recital while in the last two quarters of residence at the University. This recital will be made up of representative works of various periods and styles. Students majoring in music education and/or pedagogy are also required to participate in a formal senior recital, but such recitals may be shared by two or three music majors with the permission of the adviser.

Piano Proficiency Requirements. Music majors must meet a minimum standard of piano proficiency before graduation. The specific requirements are detailed in the Music Department manual.

GPA Requirements. In order to graduate, Music majors and Music Therapy majors must have a 2.75 overall cumulative GPA and a 3.0 cumulative GPA in music classes.

Bachelor of Music

Bachelor of Music students may choose an emphasis in Music Education (students in this program must also be approved by the Department of Secondary Education), **Performance, Piano with Pedagogy Emphasis,** or the **Individualized Program.** The Music Education and Performance programs require selection of a major performing medium, such as piano, organ, a string instrument, voice, guitar, a woodwind or brass instument, or percussion. Major requirement sheets listing specific courses of study for each area of emphasis are available through the Music Department office, Fine Arts Visual 129.

Bachelor of Science Degree in Music Therapy

The Department of Music offers a program of study leading to the Bachelor of Science degree in Music Therapy. Students who

successfully complete four years of coursework and a six-month internship (generally out-of-town) will have met all requirements for certification by the National Association for Music Therapy (NAMT) as a registered music therapist (RMT). The primary goal of the program is to prepare men and women in skills using music to provide therapy for persons with disabilities. Competencies of the music therapist are generally acquired through academic study in music; music education; the biological, behavioral, and social sciences; and special education. Specific courses of study for the music therapy major may be obtained through the Music Department office, Fine Arts Visual 129. Students must complete an application process through the Music Department in order to be accepted for the Music Therapy major.

Bachelor of Arts Degree

To obtain a BA in Music or Music Therapy, students must fulfill the foreign language requirement.

Two-year Certificate and Diploma Programs

The Music Department offers two programs leading to Certificates of Completion: (1) the Two-year Diploma Program in the areas of piano, organ, or guitar, and (2) Music Certificate in pedagogy of piano, organ, or guitar.

Both of these certificate programs are intended as verification of performance or teaching competence for individuals who intend to teach or perform but do not desire the baccalaureate degree. These programs focus on a practical music education with minimal or no involvement with general university studies.

Music Minor

The music minor programs place a strong emphasis on performance and allow for increased appeal to nonmusic majors with a broad selection of coursework. Students may choose from two minor areas: the Music Minor and the Elementary School Teaching Minor. Interested students should consult with the department regarding requirements for these minors.

Graduate Study

See the *Graduate Catalog* or the Department of Music information manual.

Music Courses

HU 101. Enjoying Music. A nontechnical course to develop understanding and enjoyment of music through listening and studying selected compositions, musical forms, and styles. (3F,W,Sp,Su) ©

HU 102. Fundamentals of Music. Scales, intervals, keys, rhythms, meters, and terminology for visual and aural perception. Designed primarily for nonmusic majors and elementary school teachers. (3F,W,Sp,Su) ©

103. Introduction to Music Education. Required of all freshman music education majors. (3F)

104. Traditional Harmony I. Fundamentals of music, traditional harmony, and four-part harmonizations in vocal style. (3W)

105. Traditional Harmony II. Traditional harmony and four-part harmonizations in vocal style continued. Prerequisite: Musc 104. (3Sp)

106. Traditional Harmony III. Traditional harmony and four-part harmonizations in vocal style continued. Prerequisite: Musc 105. (3F)

107. Music Skills I. Sight-singing; rhythmic, melodic, and harmonic dictation; keyboard harmony; computer-assisted instruction. (1F)

108. Music Skills II. Sight-singing; rhythmic, melodic, and harmonic dictation; keyboard harmony; computer-assisted instruction continued. Prerequisite: Musc 107. (1W)

109. Music Skills III. Sight-singing; rhythmic, melodic, and harmonic dictation; keyboard harmony; computer-assisted instruction continued. Prerequisite: Musc 108. (1Sp)

110. Introduction to Music Therapy. Orientation to the field of music therapy through lectures and readings. (2F)

122. Microcomputer Applications in Music. Operational knowledge of microcomputer hardware and software related to music. Computer applications related to music synthesizers. (3F,W,Sp,Su)

135. Musical Theatre Workshop. Directing and performance techniques and problems unique to musical theatre. Structured for the singing actor and school musical theatre director. (2F)

145. Introduction to Opera. Survey course tracing the history and style of opera from Peri and Caccini's "Euridice" of 1594 to the contemporary works of John Eaton and Phillip Glass. (2F)

167. Group Guitar Instruction. Fundamentals of guitar; basic chords, notes, and accompaniments to popular songs; both strumming and finger picking styles. Beginning and intermediate classes. (1F,W,Sp) ®

****174, 175, 176. Piano Literature.** Designed to acquaint pianists with the standard keyboard literature from the 14th century to the present day. (2F) (2W) (2Sp)

***177, 178, 179. Piano Literature.** A sequential listening course to present piano music. Covers baroque and rococo, classicism and early romanticism, late romanticism, twentieth century, and American music. (2F) (2W) (2Sp)

180. Group Piano. For music majors, music minors, and elementary education majors. Open to a limited number of other students. (1F,W,Sp) ®

181. Group Voice. To acquaint the nonvocal major with the vocal instrument—its mechanism, terminology, and techniques. (1F,W,Sp) ®

182. Group Woodwinds. a. Flute (1F); b. Clarinet and Saxophone; (1W); c. Double Reeds (1Sp). For music majors. Designed to give prospective music teachers a basic playing experience and theoretical understanding of the woodwind instruments. (1F) (1W) (1Sp) ®

183. Group Brass. a. Cornet (1F); b. Trombone (1W); c. Baritone/Bass (1W); d. Horn (1Sp). For music majors. Designed to give prospective music teachers a basic playing experience and theoretical understanding of the basic brass instruments. (1F) (1W) (1Sp) ®

184. Group Strings. a. Beginning (1F); b. Intermediate (prerequisite) (1W); c. Advanced (prerequisite) (1Sp). For music majors. Designed to give prospective music teachers a basic playing experience and theoretical understanding of the string instruments. (1F) (1W) (1Sp) ®

185. Group Percussion. For music majors. Designed to give prospective music teachers a basic playing experience and theoretical understanding of the percussion instruments. (1F)

186. Group Organ. For beginning organ students; manual and pedal techniques, registration, hymn playing, transposition, easy preludes and postludes. Provides them firm foundation for continued organ study. (1F,W,Sp) ®

187, 188, 189. Organ Literature. Course designed to acquaint the student with the history, development, and literature of the organ. (2F) (2W) (2Sp)

HU 201. Masterpieces of Music. Designed to foster in-depth understanding and familiarity through concentrated listening and analysis of nine selected masterworks. (3F,W,Sp)

***205. Guitar Styles (Blues/Early Rock).** Students will be taught how to play blues and early rock music stylistically correct. Music which has become "standard" repertoire in these styles will be presented and analyzed. (2F)

206. Guitar Styles (Bluegrass/Country/Ragtime). Students will be taught to play bluegrass and country music stylistically correct. Music which has become "standard" to the repertoire of these styles will be presented and analyzed. (2W)

207. Guitar Styles (Jazz/Classical). Students will be taught to play jazz and classical music stylistically correct. Music which has become "standard" repertoire in these styles will be presented and analyzed. (2Sp)

210. Introduction to Observation and Behavior Methods in Music Therapy. Students will learn basic behavior modification terminology and methods, including systematic observation and recording techniques. (2F)

222. Synthesizer Fundamentals. Students will acquire basic knowledge of musical acoustics and operation of an analog and digital music synthesizer and compositional techniques using the computer. (3F,Sp)

***230. Fingerboard Theory I (Music Theory for Guitar).** Music theory course in which the students will use the guitar as a tool for learning theoretical concepts of music. (2F)

***231. Fingerboard Theory II (Music Theory for Guitar).** Follow-up to Fingerboard Theory I. Material will include more concepts of music theory and how they can be seen and played on the guitar. (2W)

***232. Fingerboard Theory III.** Students will be taught how to arrange and compose music for the guitar using more advanced principles of music theory. (2Sp)

241. Music Skills IV. Sight-singing; rhythmic, melodic, and harmonic dictation; continued. Prerequisite: Musc 109. (1F)

242. Music Skills V. Sight-singing; rhythmic, melodic, and harmonic dictation; continued. Prerequisite: Musc 241. (1W)

243. Music Skills VI. Sight-singing; rhythmic, melodic, and harmonic dictation; continued. Prerequisite: Musc 242. (1Sp)

HU 300. History of Jazz and Popular Music. A course designed to give students an understanding of the development of jazz, popular music, and contemporary idioms, and their contributions to music and culture. (3Sp)

301. Music History—Early, Renaissance, and Baroque Periods. History and literature of the music of the Early, Renaissance, and Baroque Periods. Prerequisite: Musc 101. (3F)

302. Music History—Baroque and Classical Periods. History and literature of the music of the late Baroque and Classical Periods. Prerequisite: Musc 301. (3W)

303. Music History—Romantic Period. History and literature of the music of the Romantic Period, 1820-1900. Prerequisite: Musc 302. (3Sp)

304. Musical Form and Analysis. Study and analysis of the polyphonic and sectional forms of Western art music, including periods, binary, ternary, rondo, sonata, vocal, and other forms. (4F)

305. Twentieth Century Music. Study of Twentieth Century tonal, atonal, and avant garde harmonies and composition techniques. Analysis of Twentieth Century tonal and atonal masterpieces. Twentieth Century music history. (4W)

***308. Guitar History and Literature.** Includes a study of the development of the guitar from its early ancestors to the present. Compositions and composers for guitar will be reviewed. (3Sp)

310. Keyboard Skills. The study of sightreading, transposing, improvising, figured bass, scales, chords, and score rendering. (2F,W,Sp) ®

311. Music Recreation Techniques. An activity class involving music as therapy in recreational settings. (4W)

312, 313, 314. Pedagogy Practicum. Provides piano students with actual teaching situations for the practical application of principles studied in piano pedagogy. Supervised planning, presentation, and evaluation of lessons. (3F) (3W) (3Sp)

315, 316, 317. Piano Pedagogy. Designed to prepare qualified pianists to teach piano effectively and to acquaint them with new materials and techniques. (2F) (2W) (2Sp)

***318. String Literature.** String literature appropriate for elementary, junior high, and high school level orchestra programs. (2Sp)

321, 322. Psychology of Music. Research and laboratory course emphasizing physical, perceptual, psychological, and pedagogical bases of music behavior. (3W) (3Sp)

324. Wind Orchestra. Performance of important contemporary works from the wind band repertoire. A highly selective group. Entrance by audition only. (2W,Sp)

325. University Symphony Orchestra. Experience in performing standard orchestral literature including symphonies and major choral works. (2F,W,Sp) ®

326. Practicum Band. Provides experience for music majors and minors in rehearsal techniques, literature selection, conducting, and playing minor instruments. (1Sp) ®

327. Symphonic and Marching Band. Study and performance of symphonic band literature. Staging of formations and drills for football games fall quarter. Admission by audition. (2F,W,Sp) ®

328. Varsity Band. Preparation of "pops" type music for basketball games. Audition necessary. (1W) ®

329. Jazz Improvisation. A study of the techniques of jazz improvisation applicable to all instruments. (3F,W)

330. Jazz Ensemble. Preparation and performance of big band jazz music. Admission by audition. (1F,W,Sp) ®

333. University Choir. Performance of vocal works in a large choral organization open to all women without auditions. (1F,W,Sp) ®

334. Chamber Singers. Opportunity for the formation of various combinations of vocal ensembles. (2F,W,Sp) ®

335. Musical Theatre Production. Participation as cast or crew in a musical or operatic stage production. Musc 135 recommended as a prerequisite. (1-3W,Sp) ®

336. University Chorale. A select mixed concert chorus performing a wide range of choral literature. Admission by audition. (1F,W,Sp) ®

337. Fundamentals of Baton Technique. Prerequisite to Musc 340 or Musc 341. (3F,Sp)

339. Intermediate Choral Conducting. Techniques of choral conducting and interpretation of choral music. Prerequisite: Musc 337. (3W)

340. Choral Literature. Survey of choral music from the Renaissance to the present, with particular emphasis on music appropriate to secondary school choirs. (3Sp) ®

341. Instrumental Conducting and Rehearsal Techniques. Interpretation of the instrumental music score and basic rehearsal procedures for realization of musical values. Assigned projects in conducting. Prerequisite: Musc 337. (3W)

342. Piano Ensemble and Accompanying. Accompanying vocal and instrumental works; ensemble music for two pianos and four hands. Sight reading and repertoire development. Admission by audition. Four students per section. (1-2F,W,Sp) ®

343. Instrumental Ensembles. Offers opportunity for capable instrumentalists to study and perform music written for a variety of small ensemble combinations. (1-2F,W,Sp) ®

***344. Guitar Pedagogy (Beginning).** Designed to prepare qualified guitarists to teach guitar effectively and to acquaint them with new materials and techniques. Discussion of the business of music and setting up a private studio. (2F)

***345. Guitar Pedagogy (Intermediate).** Students will be instructed in the teaching of specific guitar styles to the intermediate guitar student. Technique used to play classical and other styles will be developed. Students will receive experience in teaching a group class. (2W)

***346. Guitar Pedagogy (Advanced).** This course will enable future guitar instructors to expand their repertoire of music for guitar to be used in teaching their students. Review and discussion of repertoire for the guitar. (2Sp)

347. Percussion Ensemble. Allows percussionists the opportunity of playing music written specifically for an ensemble consisting entirely of percussion instruments. (1F,W,Sp) ®

350. Elementary School Music for the Classroom Teacher. Methods and materials in singing, rhythms, creating music, listening, using classroom instruments, fundamental rhythms, and movement skills. (3-5F,W,Sp)

351. Secondary School Choral Methods and Materials. (4F)

353. Secondary School Instrumental Methods and Materials. (4W)

354. String Pedagogy. For qualified string players whose interest is primarily in teaching stringed instruments. Materials and teaching techniques via actual teaching experience. Candidates may be admitted only after personal consultation. (2F,W) ®

****357. Vocal Repertory I.** Survey of German Lieder, English Art Song, and French Chanson, including styles, history, and performance practice. (2F)

***358. Vocal Repertory II.** Survey of operatic repertoire from Monteverdi's "Orfeo" to the Twentieth Century, including styles, history, and performance practice. (2W)

***359. Vocal Repertory III.** Survey of Twentieth Century vocal music of American Broadway musicals and operettas, including styles, history, and performance practice, and a survey of modern vocal method books. (2Sp)

360. Individual Piano Instruction. (1-2F,W,Sp,Su) ®

361. Individual Viola Instruction. (1-2F,W,Sp,Su) ®

362. Individual Organ Instruction. (1-2F,W,Sp,Su) ®

364. Individual Vocal Instruction. (1-2F,W,Sp,Su) ®

***365. Teaching Singing to Children.** Understanding the ranges, capabilities, challenges, and maturation concerns of the young voice. Exploring ways to help children become interested in music and develop musical skills through choral experience. (3F)

367. Individual Guitar Instruction. (1-2F,W,Sp,Su) ®

368. General Music Practicum. Designed for music education majors and minors. Experience in current materials, methods, and management of the general music education program in the public schools. (4F,Sp) ®

370. Individual Woodwind Instruction. (1F,W,Sp,Su) ®

372. Individual Brass Instruction. (1F,W,Sp,Su) ®

373. Individual Percussion Instruction. (1F,W,Sp,Su) ®

374. Individual Violin Instruction. (1-2F,W,Sp,Su) ®

375. Individual Cello Instruction. (1-2F,W,Sp,Su) ®

376. Individual String Bass Instruction. (1-2F,W,Sp,Su) ®

385, 386, 387. Church Music for Organists. Designed to increase the organist's skill in playing hymns (modulation, transposition, etc.), open score reading, and arranging piano accompaniments of choral music for organ. (2F) (2W) (2Sp)

***395. Diction in Singing: English and Italian.** Study of singing diction in English and Italian, using the International Phonetic Alphabet in spoken, sung, and written drills. (2W)

****396. Diction in Singing: French and German.** Study of singing diction in French and German, using the International Phonetic Alphabet in spoken, sung, and written drills. (2Sp)

****397. Vocal Pedagogy I.** A theoretical course studying the anatomy and function of the voice, method for teaching technique, respiration, phonation, articulation, and support and health of the voice. (2F)

****398. Vocal Pedagogy II.** Application of vocal theory to the teaching of young, post-pubescent, and mature male and female voices, including the challenges of teaching each particular type. (2W)

****399. Vocal Pedagogy III.** Practicum class in which the student will teach individual vocal lessons under instructor's supervision and receive help and comments on dealing with specific students. (2Sp)

410. Music Therapy: Influence of Music on Behavior. The effect of music on the physical, social, cognitive, and communication skills of persons with disabilities. (4F)

411. Music Therapy: Methods and Procedures. Applications of music therapy with individuals in psychiatric settings. (4F)

412. Music Therapy: The Clinical Practicum and Research. Clinical and research projects in music therapy. (4Sp)

420, 421. Clinical Internship in Music Therapy. Six months resident internship in an affiliated, approved, clinical center. Prerequisite: completion of the senior year in music therapy. (2F,W,Sp,Su) (2F,W,Sp,Su)

450. Proseminar in Music History. Intensive review of styles, periods, compositional techniques, and composers of music. A different period is studied each quarter. For the undergraduate as well as master of music candidates. (3F) ®

487. Individual Recital. Performance of pieces selected by the student and approved by the instructor to be performed at the end of the senior year. (1-3F,W,Sp,Su) ®

495. Readings and Conference. An undergraduate course designed to provide special interest study. (1-3F,W,Sp,Su) ®

496H. Senior Thesis. Students design and complete a major paper/project as partial fulfillment of Honors Program requirements. Examples of projects include performance, research, composition, and musical analysis. (1-3F,W,Sp,Su)

498H. Senior Seminar. A special seminar course for students enrolled in the Honors Program. Content will change from year-to-year as it is taught by different faculty. (3Sp) ®

502. Music Therapy Practicum. Practicum experience in working with children with disabilities. Individual work stressed. (1W) ®

503. Music Therapy Practicum. Practicum experience continued in working with children with disabilities. Individual and group work stressed. (1Sp) ®

504. Music Therapy Practicum. Practicum experience in working with adults/aged with disabilities. Individual and group work stressed. (1W) ®

507. Scoring and Arranging. Theoretical and practical study of scoring for wind, string, and percussion instruments in various combinations ranging from small ensembles to the symphonic band and symphony orchestra. (3F,W)

508, 509. Counterpoint. Writing and analysis of modal tonal counterpoint in two, three, and four parts. Prerequisites: Musc 104, 105, 106, 304, 305, 306. (2F) (2W)

515, 516, 517. Advanced Piano Pedagogy. Continuation of pedagogy 315-317 with analysis, performance, and teaching of basic repertoire at the intermediate to advanced levels. (1-2F) (1-2W) (1-2Sp) ®

518. Composition and Analysis. Analysis of twentieth century masterworks: instruction in principles of music composition and guidance in completing individual composition projects. Prerequisites: Musc 104, 105, 106, 301, 302, 303. (3Sp) ®

522. Techniques in Electronic Music. Designed as a continuation of Synthesizer Fundamentals 222. Students will learn to operate large studio synthesizer and associated audio equipment. Prerequisite: Musc 222. (2-5Sp) ®

Graduate[1]

600 (f500).[2] **Introduction to Music Research.** (3)

605. Independent Study. (1-3) ®

608. Graduate Performance Ensemble. (1-2)

610. Advanced Conducting. (3)

615. Advanced Rehearsal Techniques. (3)

621. Practicum in Choral Performance. (1-6) ®

633. Seminar in Choral Literature. (3) ®

680. Seminar in Music: Philosophy, Aesthetics, and Trends. (3) ®

682. Seminar in Music Theory. (3) ®

686. Graduate Private Instruction. (1-2) ®

687. Individual Recital. (3-5) ®

688. Descriptive and Experimental Research in Music. (3)

697. Research and Thesis. (3-9) ®

699. Continuing Graduate Advisement. (1-3) ®

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[1]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

[2]Parenthetical numbers preceded by an *f* are the *former* course numbers.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

*Taught 1996-97.

**Taught 1997-98.

Department of
Nutrition and Food Sciences

College of Agriculture and College of Family Life

Head: Professor Ann W. Sorenson
Office in Nutrition and Food Sciences 213, 797-2126

Distinguished Professor Emeritus R. Gaurth Hansen; **Professors Emeritus** C. Anthon Ernstrom, Gary H. Richardson, D. K. Salunkhe; **Assistant Professor Emeritus** Frances G. Taylor; **Professors** Rodney J. Brown, Conly L. Hansen, Deloy G. Hendricks, Von T. Mendenhall, Bonita W. Wyse; **Associate Professors** Charlotte P. Brennand, Charles E. Carpenter, Daren P. Cornforth, Georgia C. Lauritzen, Donald J. McMahon, Paul A. Savello; **Assistant Professors** Jeffery R. Broadbent, Joseph Irudayaraj, Ilka M. Nemere, Marie K. Walsh, Bart C. Weimer; **Clinical Assistant Professors** Janet B. Anderson, Nedra K. Christensen, Noreen B. Schvaneveldt; **Teaching Assistant Professor** Jeffrey P. Miller; **Temporary Lecturer** Tamara S. Vitale

Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA), Master of Science (MS), Master of Arts (MA), and Doctor of Philosophy (PhD) in Nutrition and Food Sciences

Areas of specialization: BS degree in Nutrition and Food Sciences has programs of emphasis in Food Science, Dietetics, Nutrition Science, and Culinary Arts/Food Service Management (CA/FSM)

Objectives

The Department of Nutrition and Food Sciences prepares students for careers in food science, human nutrition, or culinary arts/food service management. Graduates in the food science options are prepared to work in food product development, processing, preservation, packaging, distribution, and consumer oriented areas of the food industry or to continue on to graduate degrees. Through the business option, students are prepared for management positions in food processing or food service establishments. Dietetics graduates are employed as registered dietitians in health care facilities, public health/community nutrition programs, consulting practices, food service management operations, and government agencies, as well as entry-level research positions. Nutrition Science students are educated in nutrition epidemiology, public health, and nutrition mechanisms, as well as obtaining multiple allied health skills. They are well prepared for government agency positions and emerging health care practices, as well as for graduate or professional study in nutrition or medicine. Culinary Arts/Food Service Management students are prepared to work in management positions in the food service industry.

Food Science. Students receive excellent background in chemistry, engineering, and microbiology. Students choose a specialization from the following depth areas: Food Industry, Food Engineering, Food Chemistry, Food Microbiology, Consumer, Business, International, Dairy Foods, Meat, Sensory Evaluation, Premedicine, Food Law, Nutrition, Agribusiness, and Liberal Arts and Sciences. The program is approved by the Institute of Food Technologists. Graduates are in demand by industry for positions in research, quality control, product development, and production and are sought by government laboratories. They are also qualified to enter graduate school.

Dietetics. The Dietetics Emphasis prepares students to become professional dietitians. Upon completion, graduates have professional entry-level skills in clinical nutrition, public health nutrition, and food service management, and are in great demand in the job market. Graduates are eligible to take the national registration exam upon completion of the BS degree. The program is accredited by the American Dietetic Association as a coordinated program. Students spend 16 weeks in Salt Lake City during the senior year gaining experience in community settings. Students must complete prerequisite courses and apply for enrollment in the Dietetics Program by May 1 of the sophomore year. Application forms may be obtained from the program director.

Nutrition Science. This emphasis is for students who want a solid background in human nutrition, nutritional epidemiology, and public health. It provides a thorough scientific base as preparation for government agency positions and emerging health care programs, as well as preparation for graduate or professional study in nutrition or medicine.

Culinary Arts/Food Service Management. This emphasis prepares students in culinary arts, and provides the management principles needed to effectively manage a food service operation, including human resource management, financial management, time management, communications, etc.

Minor in Nutrition and Food Sciences. Students from other majors may graduate with a minor in Nutrition and Food Sciences.

Requirements

Department Admission Requirements. Admission requirements for the Department of Nutrition and Food Sciences are the same as those described for the University on pages 8-11. Students in good standing may apply for admission to the department. Students planning to major in Nutrition and Food Sciences should take algebra, chemistry, and biology in high school.

Graduation Requirements. Students graduating in the Department of Nutrition and Food Sciences graduate in the College of Agriculture and the College of Family Life. All graduates from the department must have completed one of the four emphasis areas in the department and meet the following minimum requirements:

1. Grade point average (GPA) must be 2.5 or higher in all courses required for the major.
2. A grade of *C* or better must be received in all courses required for the major.
3. Courses required for the major may be repeated only once to improve a grade.
4. Courses required for the major may not be taken as *Pass-D-Fail* credits.

Bachelor of Science Requirements

Specific requirements for each emphasis are listed below. Requirements change periodically, and sequence of courses is important. Current course requirements and the order in which they should be taken can be obtained from the Department of Nutrition and Food Sciences.

Food Science Emphasis. The following core classes are required for all students in the Food Science Emphasis: Biol 125; BIS 140; Chem 121, 122, 123, 124, 160, 231, 232, 234, 370, 371; Econ 200; Engl 101, 201; FL 110; ASTE 305; ADVS 302; Math 105, 106, 215, 216; Stat 301, 502, 508; Micb 301; NFS 101, 122, 310, 407, 408, 444, 492, 499, 502, 503, 504, 511, 550, 551, 556, 557; Phyx 111. In addition to core classes, students in this emphasis must also take courses for one of the 16 depth areas: Food Industry, Food Engineering, Food Chemistry, Food Microbiology, Consumer, Business, International, Dairy Foods, Meat, Liberal Arts and Sciences, Sensory Evaluation, Premedicine, Nutrition, Statistics, Food Law, and Agribusiness. (For more information, see department specification sheet.)

Nutrition Emphasis. The following classes are required for all students in the Nutrition Emphasis: Biol 125, 126, 127; BIS 140; Chem 121, 122, 123, 124, 160, 231, 232, 234, 235, 370, 371; Econ 200; Engl 101, 201; FL 110; Math 105, 106, 215, 216; Stat 301, 502; ADVS 302, 549; ASTE 305; Micb 111, 112; NFS 101, 122, 301, 322, 407, 408, 440, 442, 443, 448, 499, 530, 531, 543, 550; Phyx 111, 112; Phyl 103, 130, 501, 502, 505; Psy 121.

Dietetics Emphasis. The following classes are required for all students in the Dietetics Emphasis: Biol 125; BIS 140; Chem 121, 122, 123, 124, 160, 231, 232, 370, 371; Econ 200; Engl 101, 201; FL 110; Math 105; Stat 201; ASTE 305; MHR 311; NFS 101, 122, 222, 301, 322, 405, 407, 408, 440, 442, 443, 448, 449, 450, 455, 456, 457, 458, 466, 471, 472, 475, 476, 478, 499, 530, 531, 575, 576; Phyl 130; Soc 101.

Culinary Arts/Food Service Management Emphasis. The following classes are required for all students in the Culinary Arts/Food Service Management Emphasis: Acct 201, 203; BIS 140; Chem 101; Engl 101, 200; FL 110; HEnv 105; MHR 235; NFS 101, 122, 123, 124, 125, 126, 203, 204, 205, 206, 300, 303, 306, 307, 350, 351, 473, 474, 477, 479, 480, 481, 482, 484, 485, 576; Phyl 130; and three quarters of foreign language (French preferred). (For more information, see department specification sheet).

Financial Support

The Department of Nutrition and Food Sciences, the College of Agriculture, and the College of Family Life award scholarships in addition to those available through the University Financial Aid Office. Information and application forms may be obtained from the department office. Students may also contact the department for assistance in finding employment that will enhance their academic studies. Many students are employed by the department and by private firms near the University.

Graduate Study

The Department of Nutrition and Food Sciences offers programs which lead to the Master of Science (MS) and Doctor of Philosophy (PhD) degrees in Nutrition and Food Sciences. All graduate students in Nutrition and Food Sciences must complete a Plan A (thesis) program. Admission requirements and a detailed description of degree requirements may be found in the *Graduate Catalog* and in the publication *Information for Graduate Students*, which may be obtained from the department office.

Nutrition and Food Sciences Courses

IO 101. Food Fascinations and Fallacy. What is food? Food spoilage; preserving nutrients and quality; basic processing operations; regulations, packaging, and labeling; food safety; choosing a career. Three lectures. (3F,W,Sp)

LS 122. Nutrition for People. The relation of food to health; factors influencing nutritive requirements. Relationships between state of nutrition and social, mental, and physical well-being. (3F,W,Sp) ©

123. Introduction to Culinary Arts and Food Service Management. Overview of culinary arts, including baking, entrees/sauces, etc., and food service management, including human resource management, financial management, etc. Career options in professional food service operations. Two lectures, one recitation. (3F)

124. Culinary Basics. Develops fundamental skills specific to culinary arts. Includes knife handling, culinary math, and small/large equipment use. Two lectures, one lab. (3Sp)

125. Sanitation and Safety. Principles of sanitation and safety applied to food service operations. Emphasizes personal hygiene habits and food handling practices that protect the health and safety of employees and consumers. (3W)

126. Ingredient Function. Scientific principles of ingredients and preparation methods. Explores variations in heat, cooking methods, and PH modifications, and their effect on color, flavor, and texture of foods. Three lectures, one lab. Prerequisites: NFS 123 and 124 preferred. (4Sp)

203, 204, 205. Culinary Food Preparation. Essential cooking techniques, including stocks, soups, sauces, meats, poultry, fish, grains, starches, and pantry foods. Evaluation of the quality of the finished product. One lecture and two labs. NFS 203, 204, and 205 must be taken in sequence. (5F) (5W) (5Sp)

206. Product Identification. Identification, selection, purchasing, and storage information for a diverse range of food products. (3F)

222. Nutrition in the Life Cycle. Application of nutrition principles to the human life cycle: nutrient functions, needs, sources, and alterations during pregnancy, lactation, growth, development, maturation, and aging. Prerequisites: Phyl 130 and NFS 122. (4Sp)

225. Food Preparation and Meal Management. Emphasizes kind and proportion of ingredients, manipulation, and method of cooking to obtain high quality products. Planning, preparing, and serving family meals with consideration of the nutritional needs, time, energy, and money resources of the family unit. (4F)

235. Issues in Nutrition and Food Sciences. A lecture series based on current concerns about diets and health of people, processing, safety, and regulations in the food industry. Each lecturer teaches his/her favorite issue. (2Sp)

300. Beginning Baking. Introduces theories and techniques of baking science. Focuses on yeast doughs and quick breads. (5F)

301. Perspectives of Dietetics. Introduction to profession of dietetics, assessment of nutritional status, provision of nutritional care. Clinical experience in health care facilities. Prerequisite: acceptance into Dietetics Program. (4F)

303. Advanced Baking. Strengthens baking skills focusing on procedures and techniques used in a professional bakeshop. Includes pastries and decorative techniques. Prerequisite: NFS 300. (5W)

306. Beginning Garde-Manger. Beginning cold food preparation and presentation techniques for buffets, hors d'oeuvres, food decoration, etc. (5F)

307. Advanced Garde-Manger. Advanced cold food production and presentation techniques including specialty foods and displays. Prerequisite: NFS 306. (5W)

310. Sensory Evaluation of Foods. Physiological methods and practice in the sensory evaluation of foods. Testing methods, statistical analysis, and taste panel experience. Two lectures, two labs. Prerequisites: Stat 301 and 502. (4W)

316. Methods in Biotechnology: Basic Principles. A laboratory intensive course designed to provide a foundation in basic methods in biotechnology, including cell growth, and isolation and characterization of protein and DNA. (3F,Sp)

322. Nutrition Related to Fitness and Sport. Includes information on macro/micronutrient metabolism during exercise, specific problems experienced by athletes or highly active persons, myths, ergogenic aids, and current interests. Prerequisite: NFS 122. (3F)

325. Occupational Experiences in Nutrition and Food Sciences. On-the-job training in the food industry. (2-6F,W,Sp,Su)

340. Milk Technology. Modern sanitary methods of producing, processing, and marketing milk, cream, and related products. Four lectures, one lab. (5W)

345. Meat Technology. Muscle structure, composition, grading, meat quality, pricing, sanitation, and nutritive value. Lab, taught independently, covers slaughter, processing, identification, and merchandising of beef, pork, and lamb cuts. Lab fee. (5Sp)

350. Beverage Management. Provides training in selecting and serving beverages and equipping, staffing, operating, and marketing beverages within a food service operation. Addresses issues relating to the responsibilities of serving alcohol. (5Sp)

351. Food Service Purchasing. Provides training in the selection and acquisition of commodities or services as applied to the food service industry. (3Sp)

405. Education in Clinical Dietetics. Principles of education, counseling, and communication as applied to the field of nutrition education and clinical dietetics practice. (2F)

407, 408. Science in Food Preparation. Science principles underlying modern food theory and practice. Relation of physical and chemical properties of food components and their systems to food preparation. Two lectures, one lab. Prerequisite: Chem 141 or 231. (3W) (3Sp)

440. Human Nutrition and Metabolism. Structures, properties, and metabolism of protein, lipids, carbohydrates, vitamins, and minerals, emphasizing digestion, absorption, hormonal control, cellular biochemistry, metabolic interrelationships, excretion, requirements, energy needs, and effects of deficiency or excess. Prerequisites: NFS 122, Phyl 130, Chem 370. (5F)

442, 443. Clinical Nutrition Methodology. Development of experimental design, data collection in laboratory or clinical setting, statistical analysis, interpretation, and integration of results. (2W) (2Sp)

444. Food Engineering. Basic engineering concepts and their application. Definitions, nomenclature, conservation of mass, first and second laws of thermodynamics, psychrometrics, simple power, and refrigeration cycles. Prerequisites: Phyx 112 or 222. (3F)

448. Community Nutrition. Nutritional surveys and the practice of dietetics in community health related agencies. Two lectures, one lab. (3F)

449, 450. Community Nutrition. Clinical experiences in various health related organizations and with families. Prerequisite: NFS 448. (1W) (1Sp)

455, 456. Clinical Dietetics. Biochemical and physiological abnormalities in disease. Medical treatment of disease. Role of nutrition and therapy. Prerequisites: NFS 301, 440, Chem 370. NFS 455 is a prerequisite for 456. (5W) (5Sp)

457. Clinical Dietetic Experiences. Practical experience with patients in hospitals and other health care facilities. Integrating and applying lecture material of NFS 455. To be taken concurrently with NFS 455. (3W)

458. Clinical Dietetic Experiences. Continuation of NFS 457. (3Sp)

466. Medical Dietetics. An in-depth study of nutrition relationships in disease development and treatment with clinical experience in medical facilities in Salt Lake City. Prerequisites: NFS 457, 458. (12F)

471. Quantity Food Preparation. Principles of food preparation applied to large quantity production, menu planning, food selection, storage, and equipment. Three lectures, two labs. Prerequisites: NFS 407, 408, or consent of instructor. (5W)

472. Institutional Food Organization and Management. Principles of organization, management theory, financial controls, human and labor relations, employee training, layout, and sanitation. Three lectures, one lab. Prerequisite: NFS 471. (6Sp)

473. Catering. Catering-related training in menu development and pricing, target market identification, competition analysis, management skills, product preparation, transportation, and service. (2W)

474. Dining Room Service. Quality service techniques including equipment handling, establishing service stations, table setup, preparing for special needs, and communication skills necessary in operating a successful food service establishment. (3F)

475, 476. Management of Clinical Dietetics. Principles of management of clinical dietetics, quality assurance, public relations, computer applications, and nutrition legislation. Prerequisite: NFS 466. (2W) (2Sp)

477. Computers in Food Service. Training in selection of computer systems and programs applicable to food service administration, menu planning, inventory control, labor productivity, etc. (2F)

478. Maternal and Child Nutrition. Nutritional requirements of the gravid woman, infant, and preschool child. To be taken in Salt Lake City in conjunction with NFS 466. (6F)

479. Merchandising/Marketing in Food Service. Techniques to increase sales of food and services, including cuisine themes, displays, advertising, decor, entertainment, etc. (3F)

480. History of Cuisines. Study of factors which have shaped the nature of our diet throughout history, as well as current food trends. (2F)

481. World Cuisines. Preparation of foods and beverages from around the world. Prerequisite: Senior standing in Culinary Arts/Food Service Management program. (5W)

482. Facility Design. Planning and evaluation of food service facility design incorporating principles of flexibility, labor productivity, efficient use of space and energy, and customer satisfaction. (2W)

484. Menu Design. Menu writing and merchandising based on budget, customer satisfaction, kitchen capacity, personnel skills, and size of facility. (2Sp)

485. Equipment Management. Selection and general maintenance of equipment. Conservation of energy and waste management as applied to the food service industry. (3Sp)

490. Special Problems. Individual problems and research problems for upper-division students in Nutrition and Food Sciences. (1-4F,W,Sp,Su) ®

492. Food Technology. Capstone course that incorporates and unifies the principles of food chemistry, microbiology, engineering, processing, nutrition, sensory analysis, and statistics. Prerequisite: senior standing. (3Sp)

499. Nutrition and Food Science Seminar. Student reports on current topics in Nutrition and Food Science. (1Sp) ®

502 (d602).[1] Meat Processing. Processing meat into fine and coarse ground sausages, cured meats, and restructured meats. Quality standards. Curing, cooking, smoking, rendering, fermenting, packaging and nutritional quality, and spoilage of meat products. Computer least cost formulation. Three lectures, two labs. Prerequisite: Chem 370. (5W)

503 (d603). Dairy Processing. Processing milk into cheese, ice cream, yogurt, concentrated milks, and spray-dried powders. Identity standards of regulated dairy products. Physical, chemical, and biochemical changes that occur during manufacture and storage. Bacteriological, chemical, and physical deterioration and control. Four lectures, one lab. (5F)

504 (d604). Food and Bioprocess Engineering. Standardization and compounding of biomaterials and food products; preservation processing using heat, refrigeration, concentration, and dehydration. Basic unit operations in the bioprocessing industry. Quality control of raw and finished bio-products. (4Sp)

511 (d611). Food Microbiology. Microorganisms in food production, preservation, spoilage, poisoning, and sanitation. Prerequisite: Micb 111 and 112, or Micb 301. Three lectures and two labs. (5W)

513 (d613). Food Fermentations. The microbiology and biochemistry of food fermentations. Prerequisite: NFS 511/611. Three lectures and one lab. (4Sp)

515 (d615). Microbiology of Dairy Foods. Information about the microorganisms associated with raw and processed milk. New microbial identification techniques used for lactic acid bacteria will also be discussed. Prerequisite: Micb 301. (4F)

516. Methods in Biotechnology: Cell Culture. Laboratory-intensive course in basic and applied methods of culturing cells (mammalian, insect, plant) and methods of fusing and transforming cells. Prerequisites: Biol 125 or ADVS 316 or equivalent, or permission of instructor. (3W)

****521 (d621). Advanced Public Health Nutrition and Public Policy.** The scientific basis for public health recommendations regarding nutrition and human health will be reviewed with an emphasis on epidemiology methods and population-based studies. (3Sp)

524. Methods in Biotechnology: Protein Purification Techniques. Laboratory-oriented course designed to provide basic knowledge in protein purification, analysis, and its scale up. Prerequisites: Chem 370 or ADVS 316, or permission of instructor. (3Sp)

525. Occupational Experiences in Nutrition and Food Sciences. On-the-job training in the food industry. (2-6F,W,Sp,Su)

526. Methods in Biotechnology: Molecular Cloning. Laboratory-oriented course in molecular cloning techniques such as DNA cloning, genetic probes, PCR, DNA sequencing. Prerequisites: Chem 370 or Biol 319 and Micb 301 or equivalent, ADVS 316, or permission of instructor. (3F)

530 (d630). Human Nutrition—Vitamins, Minerals, and World Food Supply. An overview of world food production and consumption trends as they relate to nutritional status of individuals. Metabolism of vitamins and minerals as applied to

nutritional requirements and food supplies of people. Prerequisites: NFS 440, Chem 370. (4Sp)

***531 (d631). Human Nutrition—Dietary Carbohydrates, Proteins, and Lipids.** Metabolism and hormonal control of carbohydrates, proteins, lipids, calcium, and phosphate. Overview of current research topics. Prerequisites: NFS 440, Chem 370. (4W)

540. Human Nutrition—An Integrated Approach. An Independent Study Division course (3) ©

***543 (d643). Developmental Nutrition.** Role of nutrition in embryonic and postnatal development including effect of maternal nutritional status in pregnancy and lactation; neonatal needs; and current infant feeding practices. (3F)

544 (d644). Food Engineering. Introductory concepts in fluid mechanics and heat transfer. Engineering measurement techniques presented in the laboratory. Prerequisite: NFS 444. (3W)

550 (d650). Food Analysis. Application of quantitative and qualitative techniques to the determination of composition and quality of food products. Prerequisites: NFS 556, 557, statistics. (5Sp)

551 (d651). Food Laws and Regulations. Provides background of federal/state laws and regulations and case law history affecting food production, processing, packaging, marketing, and distribution of food products. (3W)

556 (d656). Chemistry of Food Constituents. Chemical structure, properties, and reactions of the important chemical constituents of food. Three lectures, one lab. Prerequisites: Chem 231, 232, 370, NFS 407. (4F)

557 (d657). Chemistry of Food Systems. Chemical relationship among constituents in liquid and tissue food systems. Their reactions and interactions during food processing. Three lectures, one lab. Prerequisite: NFS 556. (4W)

575 (d675). Dietetics Clinical Practicum. Advanced practical experience in dietetics within community and/or health care facilities. Prerequisite: NFS 466 or RD. (1-10W,Sp) ®

576 (d676). Food Service Management Practicum. Advanced practical experience in food service management for Dietetics and Culinary Arts/Food Service Management majors. Prerequisite: NFS 472 or senior standing in Culinary Arts/Food Service Management program. (1-10W,Sp) ®

Graduate[2]

602 (d502). Meat Processing. (5W)

603 (d503). Dairy Processing. (5F)

604 (d504). Food and Bioprocess Engineering. (4Sp)

605. Advanced Clinical Nutrition. (2W)

610. Sensory Evaluation of Foods. (4W)

611 (d511). Food Microbiology. (5W)

613 (d513). Food Fermentations. (4Sp)

615 (d515). Microbiology of Dairy Foods. (4F)

620. Nutritional Epidemiology. (3W)

****621. Advanced Public Health Nutrition and Public Policy.** (3Sp)

623. Women's Nutritional Issues. (3)

630 (d530). Human Nutrition—Vitamins, Minerals, and World Food Supply. (4Sp)

***631 (d531). Human Nutrition—Dietary Carbohydrates, Proteins, and Lipids.** (4W)

***643 (d543). Developmental Nutrition.** (3F)

644 (d544). Food Engineering. (3W)

****645. Meat Science.** (4Su)

650 (d550). Food Analysis. (5Sp)

651 (d551). Food Laws and Regulations. (3W)

656 (d556). Chemistry of Food Constituents. (4F)

657 (d557). Chemistry of Food Systems. (4W)

****660. Food Proteins and Enzymes.** (4W)

663. Nutrition in Aging. (3Sp)

***670. Dairy Chemistry.** (3W)

675 (d575). Dietetics Clinical Practicum. (1-10W,Sp) ®

676 (d576). Food Service Management Practicum. (1-10W,Sp) ®

690. Special Problems. (1-4F,W,Sp,Su) ®

697. Thesis Research. (1-12F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

***714. Biotechnology of Lactic Starter Cultures.** (4Sp)

780. Seminar. (1F,W,Sp) ®

797. Dissertation Research. (1-12F,W,Sp,Su) ®

799. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

*Taught 1996-97.

**Taught 1997-98.

Department of
Physics

College of Science

Head: Professor W. John Raitt
Office in Science Engineering Research 250A, 797-2857

Professors W. Farrell Edwards, Bela G. Fejer, Wilford N. Hansen, V. Gordon Lind, William R. Pendleton, Robert W. Schunk, Jan J. Sojka, Vincent B. Wickwar; **Visiting Professor** David Peak; **Research Professors** F. Tom Berkey, Patrick J. Espy, Kent L. Miller, Thomas D. Wilkerson; **Adjunct Professors** Stephen E. Bialkowski, Yeaton H. Clifton, John W. Meriwether, Jr., Linda S. Powers, Paul L. Reeder, Robert G. Roper, Wolfgang Schmickler, John William Wright; **Professors Emeritus** Jack E. Chatelain, Eastman N. Hatch, Don L. Lind, L. Rex Megill, John K. Wood; **Associate Professors** J. R. Dennison, James T. Wheeler; **Research Associate Professors** Abdallah R. Barakat, Howard G. Demars, J. Steven Hansen, Ti-Ze Ma, Ching-Yan Pan, Michael J. Taylor; **Adjunct Associate Professors** I. Lee Davis, Donald R. Pettit, Charles H. Sellers, David J. Vieira; **Associate Professors Emeritus** Robert E. McAdams, Akeley Miller; **Assistant Professors** Jill Ann Marshall, D. Mark Riffe, Charles G. Torre; **Research Assistant Professors** David J. Crain, Lie Zhu; **Adjunct Assistant Professor** Charles E. Tinney

Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA), Master of Science (MS), and Doctor of Philosophy (PhD) in Physics

Objectives

The Department of Physics offers programs which are designed to prepare the physics major for a career in industry or teaching, or to continue his or her education by entering graduate school for an advanced degree.

General College of Science Requirements

Orientation Requirement. All students graduating from the College of Science are required to take the college orientation course: Sci 150, Science Orientation.

Written Communications Requirement. In addition to the University's written communication requirement, the college requires a junior level writing class. This requirement may be filled by completing either English 301 or 305.

Bachelor of Science Core Requirements. Students working toward the Bachelor of Science degree in any major within the College of Science must complete the following:

A. Math 220 and 221.

B. Either CS 160 or Stat 201.

C. One of the following sequences: (1) Biol 125 and either Biol 126 or Biol 127; (2) Chem 121, 122, and 124; (3) Geol 111 and 200; (4) Phyx 221 and 222.

Majors in Biology, Chemistry and Biochemistry, Geology, and Physics **cannot** satisfy requirement *C* by taking a sequence in their own discipline. Higher level courses than the ones listed in the three categories above may be substituted in some instances. Approval for any substitutions must be obtained in advance.

Departmental Requirements

Departmental Admission Requirements. Admission requirements for the Department of Physics are the same as those described for the University on pages 8-11. Students admitted to USU in good standing may apply for admission to the department.

Bachelor of Science in Physics. The BS degree in physics is awarded to students who demonstrate a proficiency in understanding the subject matters offered in the undergraduate physics curriculum. The following courses are required for the Bachelor of Science degree in physics: Phyx 221, 222, 223, 341, 342, 343, 374, 375, 387, 388; Phyx 389 or 2 credits of senior project, Phyx 398; Phyx 411, 412, 451, 452, 461, 462, 463, 471, 472; Phyx 473 or 474; Math 220, 221, 222, 320, 321, 322. The following courses are recommended: Phyx 401, 402, 413, 505, 534, 535, 536; Math 521, 522, 523, 541, 542, 543.

Bachelor of Arts in Physics. The requirements for the BA degree in physics include the general bachelor of arts requirements described on page 18, the orientation and written communications requirements of the College of Science (but not the core requirements), and all of the requirements listed in the previous paragraph.

Minor. Students majoring in other departments may earn a physics minor by taking Phyx 221, 222, and 223 and at least 12 credits in upper-division physics courses in a program determined by consultation with the Physics Department. A minor is not required for a student majoring in physics.

Mathematics and Physics Double Major Option. Those students interested in both physics and mathematics may consider this double major option. The course requirements are: Phyx 221, 222, 223, 341, 342, 343, 374, 375, 387, 388, 398, 461, 462, 463, 471, 472; Math 220, 221, 222, 320, 321, 322, 331, 420, 471 or 571, 521, 522, 523. One of the following sequences must be completed: Phyx 401 and 402; Phyx 411 and 412; or Phyx 451 and 452. Students must also complete at least 12 additional credits of Mathematics courses with prefixes of 500 or above. The following courses are recommended: Phyx 534, 535, 536; or Math 541, 542, 543. Contact an adviser from either department.

Computational Option. The following courses are required for the Computational Option: Phyx 221, 222, 223, 341, 342, 374, 375; Phyx 411 and 412, or Phyx 471 and 472; Phyx 451, 452, 461, 462, 463; Math 463; Math 461, or Math 561, 562, 563; CS 170, 171, 172, 220, 327, 525. If Math 461 is taken, select at least four of the following courses; if Math 561, 562, and 563 are taken, select at least two of the following courses: CS 227, 241, 355, 410, 470, 541, 542.

Electronics Option. The following courses are required for the Electronics Option: Phyx 221, 222, 223, 341, 342, 343, 374, 375,

387; Phyx 411 and 412, or Phyx 451 and 452; Phyx 461, 462, 463, 471, 472, 474. Select a minimum of 21 credits from: ECE 211, 212, 346, 347, 480, 564; ITE 340, 482. The following courses are recommended: Phyx 388, 389, 413.

Materials Science Option. The following courses are required for the Materials Science Option: Phyx 221, 222, 223, 341, 342, 343, 374, 375, 387; Phyx 411 and 412, or Phyx 451 and 452; Phyx 461, 462, 463, 471, 472, 474. Select a minimum of 21 credits from: Chem 306, 309; ECE 564; ITE 185, 285, 382, 482; MAE 371, 415, 514. The following courses are recommended: Phyx 388, 389, 413.

Microprocessor Technology Option. The following courses are required for the Microprocessor Technology Option: Phyx 221, 222, 223, 341, 342, 343, 374, 375, 387, 388, 389, 411, 412, 413, 451, 452, 461, 462, 463; ITE 133, 237, 338, 340, 341, 437.

Teaching Major. The following courses are required for a teaching major in physics: Phyx 221, 222, 223, 341, 387, 388, 389; Stat 201; Math 220, 221, 222, 320, 321, 322; Sci 430. Six credits in upper-division electives are selected from: Phyx 342, 374, 411, 412, 451, 452, 461, 462, 471, 472. Ten credits of general electives are selected from: Phyx 100 or 108 or 318, Phyx 391, 392, 393, 398, 413, 473, 474, 505. Any course in the upper-division electives may count towards the general electives. In addition to the College of Science Core Requirements, the student must take at least five credits in biology, five credits in chemistry, and five credits in geology. Physics teaching majors plan their own program with two advisers: one from the Physics Department and one from the Department of Secondary Education. Students seeking this degree must complete the requirements for the **Professional Education Component for Teaching Degrees.** Before students can enroll in the latter classes, they must have completed the Phyx 221-223 sequence with a 2.75 GPA or higher and be approved by the College of Education.

Teaching Minor. The following courses are required for a teaching minor in physics: Phyx 111, 112, 113, or Phyx 221, 222, 223; and Phyx 100 or 108. In addition, a minimum of 9 credits are selected from the following: Phyx 216, 318, 374, 387, 388, 389, 505, and Sci 430. If the student's teaching major is not in the College of Science, Sci 430 is required. Physics teaching minors plan their programs with two advisers: one from the Physics Department and one from the Department of Secondary Education. Students seeking this degree must complete the requirements for the **Professional Education Component for Teaching Degrees.**

Composite Teaching Major in Physical Science. This degree is available through the Chemistry and Biochemistry or Physics departments. Students in this major should plan their program carefully in order to meet the upper-division graduation requirements. The course requirements are: *Chemistry (22-23 credits):* Chem 121, 122, 123, 124, 160; and either Chem 231, 232, 234, or Chem 141, 142; *Physics (27 credits):* Phyx 100, 108, 221, 222, 223, plus 6 credits from Phyx 216, 318, 374, 505; *Earth and Life Science (13-14 credits):* Bmet 200 or 530, Geol 111, Biol 101; *Mathematics and Statistics (13 credits):* Math 220, 221; Stat 201; *Science (4 credits):* Sci 150, 430. Students with a Composite Teaching Major in Physical Science must complete the requirements for the **Professional Education Component for Teaching Degrees.** Before students can enroll in the latter classes, they must have completed the Phyx 221-223 sequence with a 2.75 GPA or higher and be approved by the College of Education.

Graduate Study

The Physics Department offers advanced studies leading to the Master of Science degree (MS) and the Doctor of Philosophy degree (PhD). For further information see the *Graduate Catalog*.

Physics Courses

PS 100. The Solar System. A study of the planets, the asteroids, meteors, comets, satellites of planets, artificial satellites, and space probes. Kepler's laws of motion and planetary composition. (3Sp)

PS 101. Introductory Physics. A descriptive course requiring only elementary mathematics dealing with the relationship of physical principles evident in the everyday world around us. A course designed especially for the liberal arts student and other nonscience majors. (5F,W,Sp,Su)

PS 108. Stars and Galaxies. Modern theories concerning the sun, stars, and galaxies, their physical properties, structure, evolution, and recent discoveries such as pulsars, quasars, and developments in cosmology are discussed. (3F)

PS 111, PS 112, PS 113. General Physics. A study of the laws, phenomena, and theories of the physical world, including mechanics, heat, light, sound, electricity, and magnetism. Emphasis is given to the understanding of everyday experiences. Recitation and laboratory required. Prerequisites: Math 105, 106. Should be taken in sequence, with Phyx 111 required for 112, and Phyx 112 required for 113. (5F,Su) (5W,Su) (5Sp,Su)

PS 120. General Physics Survey. A survey course in physics, with a laboratory. Designed for Elementary Education, Liberal Arts, and other nonscience majors requiring a laboratory course. (5F,W,Sp,Su)

PS 200. Astronomy. Astronomy for the student with some science and math background. The solar system; the creation, evolution, and death of stars; galaxies; and cosmology. (3F)

IO 216. Energy. A study of energy resources, utilization, conversion, and conservation. Social impacts of energy resource development including public policy and planning. (3F)

PS 221, PS 222, PS 223. General Physics—Science. A study of the phenomena, laws, and theories of the inanimate world, including mechanics, oscillations, wave motion, electricity and magnetism, and optics. Emphasis is given to the understanding of physical phenomena and to problem solving. For science majors and engineers. Prerequisites: Math 220 and recommended concurrent enrollment in Math 221. Should be taken in sequence, with Phyx 221 required for 222, and Phyx 222 required for 223. Recitation and laboratory required. (5F,Sp,Su) (5F,W,Su) (5W,Sp,Su)

224, 225, 226H. Physics Pro Seminar. Honors course. To be taken concurrently with Phyx 221, 222, and 223. (1F) (1W) (1Sp)

IO 260. Science of Sound. Introduction to sound and its uses: Physical basis of sound, perception of sound, musical sound production, electronic sound reproduction, room acoustics, environmental noise. Prerequisite: Math 101. (5Sp)

IO 318. Intelligent Life in the Universe. A study of the universe—its origin, structure, size, and composition as related to the possibility of extraterrestrial intelligent life. The feasibility of detecting other intelligent life and consequences thereof. (3Sp)

341, 342. Analytical Mechanics. Newtonian mechanics, single particle motion, central forces, systems of particles, rigid bodies, Lagrangian mechanics, and Hamiltonian mechanics. Prerequisites: Phyx 223 and 375 required for 341; Phyx 341 required for 342. (3F) (3W)

343. Topics in Mechanics. An extension of Analytical Mechanics (Phyx 341, 342). Includes continuum mechanics, fluid mechanics, and special relativity (including four-vectors and the electromagnetic field tensor). Prerequisite: Phyx 342. (3Sp)

374. Introductory Modern Physics. Concise overview of modern physics at the intermediate level. Includes special relativity, wave and particle properties of matter and photons, introductory quantum mechanics, and the fundamentals of atomic, molecular, particle, and solid state physics. Introduction to computer software for assisted learning and problem solving. Prerequisite: Phyx 223 (may be taken concurrently). (4Sp)

375. Foundations of Wave Phenomena. Survey of wave phenomena in physics, with emphasis on application of mathematical techniques to the wave equation, Schrodinger equation, and Maxwell equations. Prerequisites: Math 320, 321; Phyx 223, Math 322 taken previously or concurrently. (4Sp)

387, 388, 389. Laboratory. Students perform experiments which complement upper-division courses in mechanics, electromagnetism, thermodynamics, optics, electronics, and atomic, nuclear, and solid state physics, including some having historical significance. Emphasizes experience with modern experimental techniques, data and error analysis, experimental design, and communication skills. Prerequisites: Phyx 223, 374. (2F) (2W) (2Sp)

391, 392, 393. Selected Reading in Physics. (1F) (1W) (1Sp) ®

398. Special Problems in Physics. A course of research or individual study pursued under the direction of a staff member. The student must make previous arrangements with the staff member. Credit received is used for Senior Project. Prerequisites: Phyx 223, 374. (1-3F,W,Sp) ®

***401, 402. Astrophysics.** Application of physical principles to selected topics in astrophysics. Physics of planetary and stellar systems, including celestial mechanics, planetary atmospheres, stellar atmospheres and interiors, galactic structure and evolution, astronomical instruments and their principles of operation. Prerequisites: Phyx 221, 222, 223; Phyx 401 required for 402. (3W) (3Sp)

411, 412, 413. Wave Theory and Optics. Wave motion, geometrical optics, diffraction phenomena, aberrations, interference, polarization, and sundry topics in contemporary optics. Prerequisites: Phyx 223 and 375 required for 411; Phyx 411 required for 412; Phyx 412 required for 413. (3F) (3W) (3Sp)

425. Cooperative Work Experience. A planned work experience in industry or national laboratories. A detailed plan and the purpose of the experience must have previous approval. A written report is required. Prerequisites: Phyx 223, 374. (1-9F,W,Sp,Su) ®

451, 452. Thermal Physics. A rigorous treatment of the laws of thermodynamics. Work, temperature, heat, energy, and entropy are defined. Discussion of reversible, irreversible, and equilibrium systems. Prerequisites: Phyx 223, 374 required for 451; Phyx 451 required for 452. (3F) (3W)

461, 462, 463. Electricity and Magnetism. An intermediate-level course in electromagnetism for advanced undergraduates. Covers electrostatics, magnetostatics, time-varying electromagnetic fields, Maxwell's equations, plane waves and their propagation, fields in bounded regions, radiation, and selected elements of circuit theory. Prerequisites: Phyx 223 and 375 required for 461; Phyx 461 required for 462; Phyx 462 required for 463. (3F,Su) (3W,Su) (3Sp)

471, 472. Elementary Quantum Mechanics. Introduction to the principles of quantum mechanics including operators in Hilbert space, matrix mechanics, angular momentum and spin, perturbation theory and applications. Prerequisites: Phyx 342, 374, 375 required for 471; Phyx 461 taken previously or concurrently with 471; Phyx 471 required for 472; Phyx 462 taken previously or concurrently with 472. (4F) (4W)

473. Nuclear and Elementary Particle Physics. Applications of the principles of quantum mechanics to nuclear and elementary particle physics. This includes modeling the nuclei, particles (including quarks and leptons), and their interactions. Prerequisites: Phyx 472; Phyx 463 taken previously or concurrently. (3Sp)

474. Atomic, Molecular, and Solid State Physics. The principles of quantum mechanics applied to the structure of atoms, molecules, their interaction with radiation, the band structure of solids, and conduction mechanisms. Prerequisites: Phyx 472; Phyx 463 taken previously or concurrently. (3Sp)

505. Radiological Health and Safety. Required for authorization to utilize radioactive materials at USU, this course introduces the concepts of fundamental radioactivity, radiation detection, radiology, and practical health physics. Prerequisites: Phyx 113 and Biol 125. (3F,Sp)

525. Topics in Physics (Topic). Independent or group study of physics topics not covered in regular course offerings. Prerequisite: Phyx 471 (may be taken concurrently). (1-6) ®

***534, 535, 536. Methods of Theoretical Physics.** Mathematical tools and techniques for the physicist including: vector calculus and differential geometry, group theory, infinite series, complex analysis, differential equations, Sturm-Liouville theory, orthogonal functions, integral equations, and the calculus of variations. Prerequisites: Phyx 471 previously or concurrently with 534; Phyx 534 required for 535; Phyx 535 required for 536. (3F) (3W) (3Sp)

581, 582, 583. Physics Colloquium. A series of invited lectures on specialized topics in physics and related subjects. Prerequisite: Phyx 374 (may be taken concurrently). (1F) (1W) (1Sp) ®

Graduate[1]

601. Introduction to Solar Terrestrial Physics. (3F)

602. Upper Atmospheric Physics. (3W)

603. Upper Atmospheric Physics Continued. (3Sp)

***614. Atomic Spectra.** (3F)

***615. Molecular Spectra.** (3W)

***616. Spectroscopic Measurements.** (3Sp)

621, 622, 623. Advanced Relativity. (3F) (3W) (3Sp) [2]

631. Space Science and Engineering. (3F)

641, 642, 643. Theoretical Mechanics. (3F) (3W) (3Sp)

****651, 652, 653. Statistical Mechanics.** (3F) (3W) (3Sp)

****657, 658, 659. Applied Plasmadynamics.** (3F) (3W) (3Sp)

****661, 662, 663. Theoretical Electricity and Magnetism.** (3F) (3W) (3Sp)

***664, 665, 666. Solid State Physics.** (3F) (3W) (3Sp)

****667, 668, 669. Physics of Materials.** (3F) (3W) (3Sp)

***671, 672, 673. Quantum Mechanics.** (3F) (3W) (3Sp)

697. Thesis Research. (1-15) ®

699. Continuing Graduate Advisement. (1-3) ®

704. Ionospheric Physics. (3F) [2]

Chem 705. Atmospheric Chemistry and Photochemistry. (3W) [2]

706. Circulation of the High Atmosphere. (3Sp) [2]

721, 722, 723. Nuclear Physics. (3F) (3W) (3Sp) [2]

732. Space Science and Engineering. (3W)

771, 772, 773. Quantum Field Theory. (3F) (3W) (3Sp) [2]

781, 782, 783. Seminar. (1-3) (1-3) (1-3) ®

797. Dissertation Research. (1-15) ®

799. Continuing Graduate Advisement. (1-3) ®

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[1]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

[2]These specialty courses are taught on an irregular basis. For information about when they will be taught, contact the Physics Department.

*Taught 1996-97.

**Taught 1997-98.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Department of
Plants, Soils, and Biometeorology

College of Agriculture

Head: Professor V. Philip Rasmussen
Office in Agricultural Science 322-C, 797-2233

Professors Rulon S. Albrechtsen, J. LaMar Anderson, William F. Campbell, Steven A. Dewey, Lynn M. Dudley, John O. Evans, Anthony H. Hatch, H. Paul Rasmussen, Frank B. Salisbury, Schuyler D. Seeley, James H. Thomas, H. Grant Vest; **Adjunct Professors** Michael C. Amacher, Kay H. Asay, Ray W. Brown, N. Jerry Chatterton, Gerald D. Griffin, Charles W. Robbins, Dale R. Westermann; **Research Professors** David L. Carter, Henry F. Mayland, Stanford A. Young; **Associate Professors** Bruce G. Bugbee, John G. Carman, Lawrence E. Hipps, Donald T. Jensen, Larry A. Rupp, Ralph E. Whitesides; **Research Associate Professors** Gail E. Bingham, Esmaiel Malek, James L. Wright; **Assistant Professors** Janis L. Boettinger, Daniel T. Drost, Paul R. Grossl, David J. Hole, Roger K. Kjelgren, Richard Koenig, Jennifer W. MacAdam, Eric D. Miltner, Jeanette M. Norton, Dani Or; **Research Assistant Professor** Raymond L. Cartee; **Adjunct Assistant Professor** Kevin B. Jensen; **Lecturer** D. Craig Aston; **Research Associates** Roland G. Murdock, Robert L. Newhall; **Director of Botanical Gardens** William A. Varga; **Assistant Director of Botanical Gardens** Debbie Amundsen; **Director of Soil Testing Lab** Janice Kotuby-Amacher

Degrees Offered: Bachelor of Science (BS) and Bachelor of Arts (BA) in Crop Science, Horticulture, Environmental Soil/Water Science; Master of Science (MS), Master of Arts (MA), and Doctor of Philosophy (PhD) in Biometeorology, Plant Science, Soil Science, Ecology (plant or physical)

Areas of Specialization: Agronomy, Biotechnology/Research, Agronomic Research, General Horticulture, Ornamental Horticulture, Landscape Maintenance and Construction, Horticulture Science, Soil, Water, and Soil and Water

Certificate, Diploma, and Associate Degree Program: Ornamental Horticulture

Objectives

The department curricula emphasize understanding of basic environmental sciences, including air, water, and soil and their impact on the management of crops, greenhouses, irrigation regimes, and landscapes in arid regions. The department conducts research and disseminates information to maintain soil and water quality and to improve productivity, sustainability, and/or profitability of plant systems.

Requirements

Departmental Admission Requirements. Admission requirements for the department are the same as those described for the University on pages 8-11. Students in good standing may apply for admission to the department.

Requirements for the Major. All courses used to fulfill major requirements must be taken on an *A-B-C-D-F* basis. A 2.5 GPA is required for courses used for the major. Transfer students are required to take at least 18 credits of major subject courses in residence at USU.

Requirements for a Minor. Minors are available in Plant Science, Agronomy, Soil Science, and Ornamental Horticulture. A minimum of 24 approved credits are required, with not more than 3 credits of special problems and seminars. All courses must be taken on an *A-B-C-D-F* basis and passed with a *C* grade.

ARCPACS Certification. Students who meet specific requirements are eligible for professional certification as an Agronomist, Crop Scientist, Crop Specialist, Horticulturist, Soil Scientist, Soil Specialist, Soil Classifier, or Plant Pathologist through the American Registry of Certified Professionals in Agronomy, Crops, and Soils (ARCPACS). Students can obtain a requirement list from an adviser.

Applied Ornamental Horticulture Program. This program provides practical training in greenhouse and nursery management, turf production, floral design, and maintenance of home and commercial grounds. Coursework encompasses pest control, plant identification, construction of landscapes, management of small business, and the operation and maintenance of equipment, including small engines. As an integral part of their training, students are provided with on-the-job experience in a greenhouse, nursery, garden store, or florist shop. Students may work toward a **one-year certificate**, a **two-year diploma**, or an **Associate of Applied Science Degree**.

Bachelor of Science Degree. The department offers the Bachelor of Science Degree in three areas: (1) **Crop Science**, which deals with agronomic (commonly called field) crops such as forages, grains, oil crops, beans, peas, cotton, etc.; (2) **Horticulture**, which deals with tree fruits, berries, vine fruits, vegetables, and ornamental plants (**ornamental** includes growing, retailing, and landscape design and construction); (3) **Environmental Soil/Water Science**, which deals with soil and water in relation to plant growth and also with regard to environmental quality. In addition to practical, applied options, there are, in all three majors, science-oriented options to prepare students for research and/or graduate studies.

The course requirements for the **Crop Science Major** are designed to prepare students for a career related to the production of food and feed crops. These courses will allow a student to function well in a rapidly changing technological environment and to acquire new skills and understanding as his or her career evolves. The **Agronomy Option** is designed for students interested in learning more about the applied aspects of crop production. Some courses emphasize production techniques and systems, while others provide the student with an understanding of the principles underlying crop production. The **Biotechnology/Research Option** is designed for students who wish to participate in the development of plant-oriented

technologies at any level of employment, and for those who intend to pursue a career in private or public research or to teach at the university level. The **Agronomic Research Option** is designed for students who desire to do research in applied areas of field crops or who plan to attend graduate school.

The **Horticulture Major** prepares students for production of fruits, vegetables, turf, or ornamentals and for landscape construction and maintenance. Courses include biology, chemistry, and control of insects, diseases, and weeds. The **General Option** adds courses in production management techniques such as pruning, spraying, and business. The **Ornamentals Option** incorporates courses in landscaping (materials, design, and maintenance), greenhouse operation, and small business operation (including accounting and personnel management). In the **Landscape Maintenance and Construction Option**, students learn design, construction, and maintenance through a joint program with the LAEP Department. The **Science Option** prepares students for graduate study and for employment in technical occupations.

The **Environmental Soil/Water Science Major** is intended to provide each student with a fundamental understanding of basic sciences and mathematics, and a strong background in both soil and water sciences. Preparatory requirements include chemistry, physics, mathematics, biology, geology, and statistics. The core courses for Environmental Soil/Water Science emphasize the interactive soil/water processes in the soil's plant-rooting zone—from the microscopic to the landscape perspective. From this base, students can choose complimentary classes in either the **Soil Option, Water Option**, or the combined **Soil and Water Option** in preparation for a variety of career opportunities. The Environmental Soil/Water Science Major is complementary to existing undergraduate programs in Geology, Environmental Studies, Watershed Science, and Environmental Engineering at Utah State University.

Course Requirements

Crop Science Major

Core Courses. Biol 125, 126; Bot 440, 510; Phyx 120; PlSc 520, 521, 570; PSB 105, 489; Soil 358, 359; Stat 301.

Agronomy Option. In addition to the Core Courses, students must complete all of the following: ADVS 111; Bmet 530 or Biol 386 or Geol 111 or PlSc 476; Bot 560; Chem 111, 141, 142, 144; Ent 441; Math 105; PlSc 100, 265, 270, 428, 430, 432, 555; Soil 400, 470, 555, 556.

Biotechnology/Research Option. Complete all of the following courses: Biol 319, 521; Chem 121, 122, 123, 124, 160, 231, 232, 233, 234, 235, 236, 370, 371; Math 105, 106; Micb 301; PlSc 100, 317; PlSc 428 or 430 or 432; PSB 316, 516, 524, 526.

Agronomic Research Option. Complete all of the following courses: Biol 319; Bot 560; Chem 121, 122, 123, 124, 160, 231, 232, 233, 234, 235, 236, 370, 371; Ent 441; Math 105, 106; PlSc 265; PlSc 428 or 430 or 432; PlSc 555; Soil 400, 555, 556.

Horticulture Major

Core Courses. Biol 125, 126, 386; Bot 440, 560; Chem 111 or 121; BIS 140 or CS 150; Ent 441; Math 105; PlSc 100, 110; PlSc 225 or 425; PlSc 265, 270, 316; PSB 105, 489; Soil 358, 359, 555.

General Option. In addition to the Core Courses, select 53 credits from the following. Those marked with an asterisk (*) are required. Biol 319; Bot 510*; Chem 141*, 142, 144; PlSc 220, 261*, 317, 360, 430, 440*; PlSc 445* or 450*; PlSc 476, 520*, 521, 555*, 560, 570.

Landscape Maintenance and Construction Option. In addition to the Core Courses, students must complete all of the following: LAEP 120, 135, 136, 260, 350, 361, 362; PlSc 220 or 555; PlSc 260, 261, 340, 360, 420; PlSc 440 or 445 or 450.

Ornamental Option. In addition to the Core Courses, select 53 credits from the following. Those marked with an asterisk (*) are required. ASTE 344; Biol 319; Bot 510*; Chem 141*, 142, 144; PlSc 237, 260*, 261*, 305, 310, 317, 320, 330, 340, 360, 420, 440*; PlSc 445* or 450*; PlSc 520*, 521, 555*, 560.

Science Option. In addition to the Core Courses, select 53 credits from the following. Those marked with an asterisk (*) are required. Biol 319*; Bot 420, 510*; Chem 122*, 123*, 141*, 160, 231, 232, 370; Math 106, 215*; Phyx 120*; PlSc 317, 440*; PlSc 445* or 450*; PlSc 476, 520*, 521*, 555*, 560, any ornamental horticulture course*; Stat 301*.

Environmental Soil/Water Science Major

Core Courses. Biol 125, 126; either Chem 111, 141, 144, or Chem 121, 122, 123, 124; Chem 142 or 231 or 370; CS 150 or 170; FW 280 or 284 or Biol 386; Geol 111; either Math 105, 106, 220, or Math 220, 221, 222; either Phyx 111, 112, 113, or Phyx 221, 222, 223; Stat 301; PSB 489; Soil 200, 358, 359, 400, 505, 513, 565, 575.

Soil Option. In addition to the Core Courses, select 20 credits from the following: BIE 518; Bmet 525; Bot 440; CEE 573, 580; Chem 160; Geog 575, 593; Geol 250, 305, 310, 360, 540; Math 221; PlSc 476; Soil 470, 527, 530, 531, 555, 556, 566.

Water Option. In addition to the Core Courses, select 20 credits from the following: ASTE 526, 555; Bmet 200, 382, 530; Bot 420, 440; CEE 343, 573; Chem 160; FW 460, 551, 560; Geol 540, 548; Math 221; PlSc 476, 520, 521; Soil 470, 562, 566; WS 420, 475, 545.

Soil and Water Option. In addition to the Core Courses, select a combination of 20 credits from the Soil Option and the Water Option.

Applied Ornamental Horticulture Program

One-Year Certificate (40 credits required). PlSc 260 and 261 are required; 28-31 additional PlSc credits must be completed from Core Courses emphasizing Floriculture or Landscape Horticulture; and 3-6 credits from Approved Electives.

Two-Year Diploma (80 credits required). Students must complete all Core Courses (60 credits); and 20 credits selected from approved electives.

Associate of Applied Science degree (96 credits required). Students must complete all Core Courses; 15 credits of Approved Electives; and 21 credits of Written Communication and General Education (Engl 101 or 111; Engl 200 or 201; 3-6 credits Social Sciences/Humanities; 4-7 credits Life Sciences/Physical Sciences).

Core Courses. ASTE 344; BIS 140; PlSc 100, 110, 220, 225, 237, 240, 260, 261, 305, 310, 316, 320, 330, 340, 360, 420; PSB 105.

Approved Electives. Acct 105; ADVS 302; Biol 125, 126; Chem 111; Engl 101; InsT 100; LAEP 103; Math 101; MHR 235; PlSc 290, 301, 302, 317, 440, 445, 450; Soil 200.

Minor Requirements

Crop Biotechnology Minor (24 credits required). The following courses are required: PlSc 220 or 555; PlSc 520, 570; PSB 316. Select the balance of the 24 credits from the following courses (must include at least one course marked with an asterisk): PlSc 316*, 317*, 428*, 430*, 432*, 440*, 450*, 560*, 635, 660; PSB 516, 524, 526.

Agronomy Minor (24 credits required). A minimum of 9 credits of Soil Science courses must be taken, including Soil 358. A minimum of 9 credits of Plant Science courses must be taken, including two of the following three classes: PlSc 428, 430, 432. Select the balance of the 24 credits from the following courses: Soil 359, 400, 470, 513, 530, 555, 556, 565; PlSc 220 or 555; PlSc 440, 450, 520, 560, 570.

Soil Science Minor (24 credits required). The following courses are required: Soil 358, 359. Select the balance of the 24 credits from the following courses: Soil 400, 470, 505, 513, 527, 530, 555, 556, 565, 566, 575.

Horticulture Minor (24 credits required). The following courses are required: PlSc 260 or 261 or 420; PlSc 316, 440; PlSc 445 or 450, Soil 200. Select the balance of the 24 credits from the following courses: PlSc 220, 265, 270, 305, 310, 317, 330, 360, 420.

Ornamental Horticulture Minor (24 credits required). The following courses are required: PlSc 237 or 260 or 261; PlSc 240; Soil 200. Select the balance of the 24 credits from the following courses (nine credits must be upper division): PlSc 220, 237, 260, 261, 305, 310, 316, 317, 330, 340, 360, 420; PlSc 440 or 445 or 450.

Graduate Study

Master of Science and Doctor of Philosophy Degrees are offered as follows: (1) **Plant Science** with specialization in plant breeding, plant nutrition, crop physiology, crop production and management, molecular biology, weed control, and plant nutrition; (2) **Soil Science** with specialization in soil physics, soil and water chemistry, soil fertility and plant nutrition, and soils and irrigation; (3) **Biometeorology** with specialization in land-atmosphere interactions, agricultural meteorology, boundary-layer meteorology, climatology, and remote sensing; (4) **Ecology** with specialization in plant or physical ecology.

Plant Science Courses

LS 100. Introduction to Agricultural Plant Science. A survey course which includes a discussion of world crops, soil, water, agricultural chemicals, and structure and function of plants. (4F,Su) ©

110. Horticulture Seminar. Leaders from diverse areas of horticulture will discuss their areas of expertise and describe horticultural employment and business opportunities. One lecture per week. (1F)

220. Weed and Pest Control. Overview of pest control procedures and principles, primarily for horticultural crops. Topics include IPM, organic and chemical pest control, safety procedures, life cycles of pests, and commercial pesticide licensing. Two lectures, one lab. (3W)

225. Occupational Experience in Agronomy and Horticulture. Students will receive credit for on-the-job training in agronomic or horticultural industries. Prerequisite: instructor's consent. (1-6F,W,Sp,Su) ®

237. Indoor Plants and Interiorscaping. Identification, culture, installation, and maintenance of indoor foliage and flowering plants used in the interior plantscaping industry. Two lectures, one lab. (3W)

240. Home Horticulture. The planting and care of fruits, vegetables, lawn, flowers, trees, and shrubs for the home environment. (3W)

260. Herbaceous Plant Materials. The identification, culture, and utilization of herbaceous ornamental plants in the landscape including annuals, perennials, ground covers, bulbs, and roses. Two two-hour lecture/laboratories per week. (3F)

261. Woody Plant Materials. The identification, culture, and utilization of woody ornamental plants in the landscape. Two two-hour lecture/laboratories per week. (3Sp)

265. Identification and Selection of Plants in Production Agriculture. Identification of plants that are important in agriculture and the morphological features that make them useful for various agricultural purposes. (2F)

270. Principles of Heredity in Breeding. Introduction to genetic principles utilized to improve crop cultivars through plant breeding. (2W)

290. Special Problems in Ornamental Horticulture. Student-selected practical problems in horticulture. (1-5F,W,Sp,Su) ®

301. Flower Arranging for the Home. Principles of design, care, and use of floral materials in arrangements and corsages. House plant care. Lab fee required. (3F)

302. Floral Design and Judging. Advanced floral design. Evaluating design will be emphasized. One lecture and one laboratory. Prerequisite: PlSc 301 or instructor's consent. Lab fee required. (2W)

305. Greenhouse Design and Management. Principles of greenhouse and controlled environment operation; including structure types, methods of environmental control, handling of materials, and crop programming. Three lectures. (3W)

310. Greenhouse Crop Production. Principles and practices used in growing commercial greenhouse crops. Three lectures, one lab. Prerequisite: PlSc 305 (recommended). (4Sp)

316. Plant Propagation. Principles and practices of propagation of horticultural plants, emphasizing vegetative techniques such as grafting, cuttings, and division. Two lectures, one lab. (3W)

317. Micropropagation. Practical exposure to and scientific basis of laboratory techniques used in the commercial micropropagation of horticultural, agronomic, and forestry plants. Prerequisites: Biol 126, Math 101. One lecture and one laboratory. (2F)

320. Garden Center Management. Merchandising, selling techniques, advertising, and general management of horticultural businesses. (3Sp—applied students or instructor's consent)

330. Residential Landscapes. Functional and aesthetic relationships of plants and structures in the landscape and their installation. Prerequisites: PlSc 260, 261. Two lectures, two labs. (4W)

340. Landscape Management for the Interior West. Maintenance of trees, shrubs, and turfgrass in interior-west landscapes. Prerequisites: PlSc 260, 261 (recommended). Three lectures. (4F) ©

341. Landscape Management for the Interior West Laboratory. Practical experience in landscape management for the interior west. Includes field trips to view management of different types of landscapes and hands-on learning. (1F)

360. Arboriculture. Culture of trees and shrubs with emphasis on ecological adaptation to landscape conditions. Prerequisite: PlSc 261 or instructor's consent. (3Sp)

410. Landscape Water Management. How to conduct water audits and schedule timing and amount of water application for irrigated landscapes. Also presents concepts in low-water use landscapes. Prerequisite: Math 105. (3Sp)

420. Turfgrass Science and Culture. Characteristics and culture of grasses for different regions and uses. Three lectures, one lab per week. (4Sp)

425. Occupational Experience. On-the-job training in agronomy or horticulture. Prerequisite: instructor's consent. (1-6F,W,Sp,Su) ®

428. Field Crops. Classification, cultural methods of commercial production and market grades of cereal, root, and oil seed crops. (4W)

430. World Food Crops and Cropping Systems. Major and minor world food crops and production systems. Effects of climate, physiology, public demands, and economics on food production. Impacts of food on human history, society, politics, and economics. (3W)

432. Forage Crops. The cultivation and management of legumes and grasses used for grazing, silage, hay production, soil improvement, and conservation. Laboratories include plant development, nutrition, and plant and seed identification. Three lectures, one lab per week. (4Sp)

440. Vegetable Production. Principles and practices underlying production of vegetable crops, including varieties, fertilizers, pest control, harvesting, storage, and processing. Emphasis will be placed upon culture of the major vegetable crops. Prerequisite: Biol 126 (recommended). (3W)

****445. Small Fruit Culture.** Principles and practices for managing small fruit plantings with emphasis on strawberries, cane berries, and grapes. Two lectures, one lab per week. Prerequisite: Biol 126 (recommended). (3W)

450. Fruit Production. Cultivars, physiology, anatomy, propagation, sites, soils, climate, culture, irrigation, fertilizers, insect and disease control, harvesting, storage, marketing, economics. Three lectures, one lab per week. Prerequisite: Biol 126 (recommended). (4F) ©

476 (d676).[1] Crop Ecology. Features of agroecosystems compared with natural ecosystems; input of energy and materials to manipulate agroecosystems and produce maximum, sustained quality and yield of agricultural products. Prerequisites: Bot 440 (required), PlSc 520/620 (recommended), or instructor's consent. (3W)

520 (d620). Crop Physiology. The relationship between physiological processes and yield. Light interception and canopy geometry, canopy photosynthesis, respiration, carbon partitioning, source-sink relationships, and water use efficiency. Prerequisites: Bot 440 and Math 105, or instructor's consent. Three lectures. (3Sp)

521 (d621). Crop Physiology Laboratory. Measurement of physiological processes which result in plant growth: photosynthesis, respiration, transpiration, and carbon partitioning. Prerequisite: PlSc 520 or 620 prior to or concurrently. (2Sp)

555 (d650). Weed Science. Identification of weeds, weed problems, and methods of weed control in agricultural and urban settings. Three lectures, one lab per week. (4Sp)

560. Seed Physiology and Production. Germination, viability, and longevity of seeds; seed quality and seedling vigor; germplasm identity and maintenance; pest tolerance and control; and stress physiology and factors limiting productivity. (4F)

***570 (d670). Plant Breeding.** Principles, techniques, and practices in breeding improved varieties of crop plants. Prerequisites: Biol 319 or PlSc 270 or instructor's approval. (3Sp)

Graduate[2]

620 (d520). Crop Physiology. (3Sp)

621 (d521). Crop Physiology Laboratory. (2Sp)

****635. Plant Tissue Culture: Principles and Applications.** (3F)

****643. Plant Nutrition.** (3F)

650 (d555). Weed Science. (4Sp)

***655. Biochemical Basis of Herbicidal Action.** (3W)

***660. Principles of Cytogenetics.** Prerequisite: Biol 319. (4F)

***670 (d570). Plant Breeding.** (3W)

676 (d476). Crop Ecology. (3W)

Soil Science Courses

PS 200. Soils, Waters, and the Environment: An Introduction. Role of soils in current environmental problems, including waste disposal, water quality changes, global climate changes, sustainable agriculture, and soil conservation. (3F,W) ©

358. General Soils. Introduction to soils as a natural resource. Chemical, physical, and biological properties and processes related to soil formation and management. Prerequisite: Chem 111 or equivalent. (4F,Sp) ©

359. General Soils Laboratory. Laboratory analysis of soils, including demonstrations and/or field trips. Prerequisite: Soil 358 or equivalent previously or concurrently. (2F,Sp)

IO 400. Soil and Water Conservation. A holistic approach to managing agronomy systems (soil-water-plant-atmosphere continuum) in a way that will optimize soil and water conservation while maintaining production. (5F)

470. Irrigated Soils. Soil salinity, soil-moisture-plant relationships, water supply and quality, irrigation water measurements, soil moisture movement, irrigation methods. Prerequisite: Soil 358 or equivalent (recommended), or instructor's consent. (4W)

505 (d605).[1] Principles of Environmental Soil Chemistry. Chemistry of the soil matrix-soil solution interaction as related to environmental processes, emphasizing the surface chemistry and ionic equilibrium relationship. Prerequisite: Soil 358, Chem 121, or equivalent. (3W)

513 (d613). Soil Genesis, Morphology, and Classification. Morphology, development, and classification of soils. Lectures and weekly field exercises emphasize soil as a natural body on the landscape: its evolution, behavior, and interpretation. Prerequisites: Soil 358 and 359 (recommended). (5Sp)

527 (d628). Properties and Management of Wildland Soils. Biological, chemical, and physical properties of wildland soils; site productivity and classification of wildlands; techniques for managing wildland soils and the consequences of management. (3F)

530 (d630). Soil Microbiology. Activities and ecology of microorganisms related to soil environment, soil fertility, soil organic matter, rhizosphere, and soil amendments. Prerequisites: Biol 125, Chem 141 or 231. (3F)

***531 (d631). Soil Microbiology Laboratory.** Application of soil microbiological techniques. Two labs. Prerequisite: Soil/Micb 530/630 taken concurrently or previously. (2W)

555 (d655). Soil and Plant Nutrition. Essential nutrients in plants and their forms in the soil. Chemical and biological basis of the bioavailability of nutrients to plant roots. Transformations and availability of soil amendments. Prerequisites: Soil 358 and Chem 111 or 123. (3W)

556 (d656). Soil and Plant Nutrition Laboratory. Soil analysis by chemical and biological procedures for assessment of nutrient availability of soils. Basic soil characterizations related to plant growth conditions. Prerequisite: Soil 555/655 prior to or concurrently. (2W)

***562 (d672). Chemistry of Aquatic Systems.** Emphasis on the chemical processes occurring in natural environments. Principles of physical chemistry applied to problems involving the composition of natural waters. Prerequisites: Chem 121, 122, and 123. (3Sp)

565 (d665). Applied Soil Physics. Physical properties of soils and relations to water and climatic factors. The relation of soil water content and potential to water flow, solute transport, plant growth, soil water flow, heat flow, and aeration are emphasized. (3F)

566 (d666). Applied Soil Physics Laboratory. Methods of analysis. Prerequisite: Soil 565 prior to or concurrently, or instructor's consent. (2F)

575. Environmental Quality: Soil and Water. Environmental quality case studies presented through lectures and readings. Students research and present integrative solutions using soil/water sciences. Prerequisites: Soil 358 (required), and Soil 505/605, 513/613, and 565/665 (recommended). (3Sp)

Graduate[2]

605 (d505). Principles of Environmental Soil Chemistry. (3W)

613 (d513). Soil Genesis, Morphology, and Classification. (5Sp)

***614. Flow and Transport in Unsaturated Soils.** (3F)

****619. Salt-affected Soils.** (3W)

628 (d527). Properties and Management of Wildland Soils. (3F)

***630 (d530). Soil Microbiology.** (3W)

***631 (d531). Soil Microbiology Laboratory.** (2W)

****635. Soil and Environmental Biogeochemistry.** (3W)

655 (d555). Soil and Plant Nutrition. (3W)

656 (d556). Soil and Plant Nutrition Laboratory. (2W)

665 (d565). Applied Soil Physics. (3F)

666 (d566). Applied Soil Physics Laboratory. (2F)

****672 (d562). Chemistry of Aquatic Systems.** (3Sp)

****715 (f615). Physical Chemistry of Soils.** (3Sp)

***721. Pedology.** (3W)

***727 (f627). Soil Solute Processes.** (3Sp)

Biometeorology Courses

PS 200. Introduction to Weather. Introduction to the basic processes of weather including temperature, wind, clouds, precipitation, storms, air masses, atmospheric circulation, and their impact on human activities. (3F,Sp,Su)

310. Global Climate—A Connected System. Examination of the factors which produce the climate of the globe, emphasizing interactions between the oceans, biosphere, and atmosphere. Prerequisite: science major or university science background. (3F)

325. Aviation Weather. Discussion of weather important for pilots and those associated with air travel. Prerequisite: Bmet 200 prior to or concurrently. (3Sp)

PS 382. Regional Climatology. Descriptive treatment of regional and world climates with emphasis on the geographical features and the associated physical mechanisms that produce different climatic regions. (3W)

525 (d625).[1] Principles of Remote Sensing and Applications in Agriculture and Hydrology. Techniques for ground-based measurements of reflected and emitted radiation as well as ancillary data collection to support airborne and satellite remote sensing studies in agriculture and hydrology. Recommended: Introductory calculus and physics. (4Sp)

530 (d630). Introduction to Meteorology. Introduction to principles of meteorology for students with science background. Treatment of the nature of storms, winds, clouds, precipitation, and atmospheric circulation. Prerequisite: junior standing. (4W)

541 (d641). Synoptic Meteorology. Study and analysis of the synoptic structure of climate, with special interest in geographical distributions and practical prediction of global climates. (3W)

550 (d650). Microclimate and Biophysics of Plant Canopies. An examination of the soil-plant-atmosphere interactions which shape the microclimate of vegetated surfaces. Emphasis is directed towards understanding the fundamental principles, and nonlinear feedbacks. (3Sp)

Graduate[2]

625 (d525). Principles of Remote Sensing and Applications in Agriculture and Hydrology. (4Sp)

630 (d530). Introduction to Meteorology. (4W)

****635. Physical Climatology.** (3Sp)

***640. Climate Modeling.** (3Sp)

641 (d541). Synoptic Meteorology. (3W)

650 (d550). Microclimate and Biophysics of Plant Canopies. (3Sp)

****652. Introduction to Biometeorological Instrumentation.** (3W)

****653. Biometeorological Instruments Laboratory.** (3Sp)

655. Micrometeorology. (3W)

704. Ionospheric Physics. (3F)

Plants, Soils, and Biometeorology Courses

105. Plants, Soils, and Biometeorology Orientation. Orientation to the teaching, research, and extension programs of the department and the opportunities in the field. (1F)

316. Methods in Biotechnology: Basic Principles. A laboratory intensive course designed to provide a foundation in basic methods in biotechnology, including cell growth, and isolation and characterization of protein and DNA. (3F,Sp)

489. Seminar. Review and discussion of current plant and soil science issues and preparation for employment. Majors are required to take this class throughout each quarter during their junior or senior year. One lecture. (1F,W,Sp) ®

490. Special Problems. Conferences or laboratory investigations. Subject and credit arranged. Must be approved by the department. (1-5F,W,Sp,Su) ®

516. Methods in Biotechnology: Cell Culture. Laboratory-intensive course in basic and applied methods of culturing cells (mammalian, insect, plant) and methods of fusing and transforming cells. Prerequisites: Biol 125 or ADVS 316 or equivalent, or permission of instructor. (3W)

524. Methods in Biotechnology: Protein Purification Techniques. Laboratory oriented course designed to provide basic knowledge in protein purification, analysis, and its scale up. Prerequisites: Chem 370 or ADVS 316, or permission of instructor. (3Sp)

526. Methods in Biotechnology: Molecular Cloning. Laboratory oriented course in molecular cloning techniques such as DNA cloning, genetic probes, PCR, DNA sequencing. Prerequisites: Chem 370 or Biol 319 and Micb 301 or equivalent, ADVS 316, or permission of instructor. (3F)

Graduate[2]

689. Seminar. (1F,W,Sp) ®

690. Special Problems. (1-5F,W,Sp,Su) ®

697. Research and Thesis. (1-18F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

789. Seminar. (1-3W,Sp) ®

790. Special Problems. (1-8F,W,Sp,Su) ®

797. Research and Thesis. (1-18F,W,Sp,Su) ®

799. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing; parenthetical numbers preceded by an *f* are the *former* course numbers.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

*Taught 1996-97.

**Taught 1997-98.

Department of
Political Science

College of Humanities, Arts and Social Sciences

Head: Professor Randy T. Simmons
Office in Main 320A, 797-1306

Professors William L. Furlong, H. Preston Thomas; **Professor Emeritus** Claude J. Burtenshaw; **Associate Professors** Peter F. Galderisi, David B. Goetze, Roberta Q. Herzberg, Amal Kawar, Carolyn Rhodes, Veronica Ward; **Assistant Professors** Jing Huang, Michael S. Lyons, Peter McNamara

Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA), Master of Science (MS), and Master of Arts (MA) in Political Science; BS and BA in Prelaw

Objectives

The Department of Political Science offers a flexible program to accomplish the following objectives:

1. to provide students with theoretical and factual understanding of government, politics, and political philosophy, nationally and internationally;
2. to develop in students analytic ability, communication skills, and facility with political research methods;
3. to prepare students for effective participation in civic affairs, careers in government and the teaching of government, and graduate study in political science, law, and other fields related to the public sector;
4. to contribute to the liberal arts curriculum of the University and to enrich the educational experiences of students in all programs of study.

Requirements

Departmental Admission Requirements

Admission requirements for the Department of Political Science are a 2.0 GPA for Political Science majors and a 3.0 GPA for Prelaw majors. Students in good standing may apply for admission to the department.

Prerequisites

It is assumed that students registered for upper-division political science courses have acquired the basic knowledge and information taught in the lower-division courses required for the major. Anyone who wishes to take an upper-division course, but has not had the appropriate prerequisites, should consult with the instructor before registering. Faculty members reserve the right to drop from upper-division courses students who do not meet these requirements.

Graduation Requirements

Political Science Majors. Students must have at least 52 credits in the field. These must include PolS 101, 110, 210, 220, 235, 300, and 499. PolS 499 is a senior seminar and may be taken as early as the final quarter of the junior year. In addition, students must take a minimum of eight upper-division credits in each of two depth areas (U.S. Government, Comparative Politics, International Relations, or Political Theory). Internship credit does not count toward the depth requirement. A 2.5 overall GPA in political science courses and a 2.0 overall GPA are required.

Prelaw Majors. Students must have at least 52 credits in political science. These must include PolS 110, 120, 235, 471, 472; and PolS 473 or 499. PolS 499 should be taken as early as the final quarter of the junior year. A 3.0 GPA in political science courses and a 3.0 overall GPA are required.

Minor. Students can obtain a minor in political science by completing a total of 27 credits in the field. PolS 101 is required as well as three courses from among PolS 110, 210, 220, and 235. The remaining credits must be from upper-division courses.

Teaching Major. This program is intended exclusively for students seeking careers in **secondary** education. Students must have at least 53 credits in political science courses chosen from a list available from the department and in the *USU Secondary Teacher Education Program Undergraduate Planning Guide* available at the USU Bookstore. A 2.5 GPA in political science courses and a 2.75 overall GPA are required.

Teaching Minor. This minor is designed specifically for students seeking careers in **secondary** education. Students must have at least 27 credits in political science chosen from a list available from the department and in the *USU Secondary Teacher Education Program Undergraduate Planning Guide* available at the USU Bookstore.

Certificate in International Relations

Certificates are intensive programs of study similar to majors, but involving courses in more than one academic discipline. Political science, economics, and business, for example, may be combined. The Political Science Department participates in the International Relations certificate program. It is designed for students entering graduate programs in international relations or those planning careers in international business or diplomacy. Information on this certificate is available from the Political Science Department, Main 320A.

Internships

The department places approximately 25 students in government internships each year. Most of these interns work with a member of the Utah delegation to the U.S. Congress in Washington D.C., a member of the Utah Legislature in Salt Lake City, a political campaign, a state or local administrative agency, or a lobbying group. Students in any major, of at least junior class standing, and a GPA of 3.0 are eligible to apply.

Pi Sigma Alpha

Pi Sigma Alpha is the national honorary political science society. A member must have at least 15 credits of political science with a 3.0 GPA and a 3.0 GPA overall.

Graduate Study

Master's Degrees in Political Science. The programs of study for the Master of Science and Master of Arts degrees in political

science emphasize political economy and require 45 credits in Political Science. Students interested in the programs should consult with the Political Science graduate director.

Political Science Courses

SS 101. Government and the Individual. Introduction to political science. Origin and justification of government. How and why people get involved in politics. Different forms of government. Government and public policy. Emphasizes basic ideas and theories. (4F,W)

SS (AI) 110. United States Government and Politics. U.S. Constitution, political parties and elections, pressure groups, Congress, president, bureaucracy, courts, civil rights and liberties, and foreign affairs. This course meets the Americanization requirement. (5F,W,Sp) ©

111. American State and Local Government and Politics. State constitutions, legislature, governors, courts, counties, municipalities, special districts, and intergovernmental relations. (4)

120. Introduction to Law. Courts in both their legal and political roles. (5Sp)

205. Clash of Cultures. An interdisciplinary course to develop an appreciation of other societies, their values, institutions, and behavioral patterns. (5)

SS 210. Introduction to International Politics. Analysis of the national-state system as well as interdependence of the global community. (5)

SS 220. Comparative Politics. Comparisons of differences in political culture, institutions, and processes, including authoritarian to democratic systems, violence and corruption, political development, and public policy. (5)

235. Introduction to Political Theory. A survey course covering ancient and modern political theory. (4)

300. Introduction to Political Research. Methodology, methods, and approaches used to study and analyze political events and relationships, including the use of library resources. (4W)

310. Political Economy of Global Interdependence. The origins and consequences of conflict and cooperation in an interdependent global community are examined in order to analyze how transnational, as well as competing national, interests and institutions affect economic, political, and environmental choices and outcomes. (3)

311. Parties and Elections. Political parties, campaigns, and elections. (4)

313. U.S. Legislative Politics. Legislative process in the U.S. Congress. (3)

314. The Presidency. The systematic study of the U.S. Presidency. The presidential role, character, and powers are investigated, as are the presidential transactions with selected publics. (3)

316. Regulation in a Federal System. How federalism constrains the manner in which regulation is and can be undertaken in the U.S., as well as the relative advantages of alternatives. (3Sp)

319. Women, Power, and Politics. Examines the uses of power and the participation of women in politics cross-culturally and in different regimes. (4)

321. Western European Government and Politics. Britain, France, Germany, Scandinavia, and the European Union. (5)

322. Political Violence and Revolution. Study and analysis of political violence from state coercion, terrorism, and coup d'etat to revolution. (4)

323. Middle Eastern Government and Politics. General overview of political cultures and political developments in the Middle East. (4)

327. Government and Politics of Mexico, Cuba, and Central America. Study and analysis of revolutions and evolution toward democratic and/or military rule. (4)

328. Government and Politics of South America. Study and analysis of the evolution of politics from authoritarian regimes to democracy and back. (4)

331. American Political Thought. The history of American political thought from its European antecedents to the present. (4)

332. Asian Political Thought. Political philosophies and historical thought of the Asian region. (4)

343. Political Geography. The relationship between earth and state. World political phenomena studied from a geographic point of view, including international boundaries, territorial seas, and landlocked states. (3W)

346. Politics and War. Causes and implications of war will be examined. Wars from general to limited will be studied, including specific case studies such as the Vietnam War. (3)

380. Introduction to Public Policy. Examines different approaches to the study of public policy and different value dimensions in the design of policies. (3Sp)

410. Politics and Public Policy. Explains public policies as rational expressions of political self-interest and explores the relationship between self-interest and values such as "equity" and "efficiency" in policy. (4)

411. Comparative Public Policy. Involves the application of economic methods to the study of politics and public policy. (4F)

416. State and Local Government. Includes state and local politics, in addition to metro-urban politics. (4F,W,Sp,Su)

418. Natural Resources and Environmental Policy: Political Economy of Environmental Quality. Causes of environmental and natural resources problems and evaluation of political and private responses to them. Study of economics and politics applied to the environment. Production, protection, and allocation of scarce resources by markets and political systems. (4)

422. Russian and Eastern European Government and Politics. (4W)

423. Modern Russian Politics. Russian political attitudes, the distribution of power, institutions and performance, democracy and dissent, and prospects for reform. (3)

424. Japanese Government and Politics. (4)

425. Chinese Government and Politics. (5)

426. Southeast Asian Government and Politics. (4)

427. Transitions to Democracy. Examines the structure and performance of "authoritarian" political systems, including centralized "socialist" systems and traditional dictatorships. (4)

428. Politics of Development. Political development, including changes in institutions, attitudes, level of participation, basis of legitimacy, and increased centralized power and government capabilities. (4)

429. Political Movements in the Middle East. Analysis of political movements in the Middle East since World War I. Countries covered are Turkey, Iran, the Arab nations, and Israel. (4)

432. History of Political Thought I. Issues and thinkers in ancient and medievel political thought. (4)

433. History of Political Thought II. Issues and thinkers in contemporary political thought. (4)

435. Evolution, Choice, and Social Cooperation. Focuses on the theme of human social cooperation. Constraining influence of evolution and environment on ability of the human species to form social communities and to achieve socially desirable cooperation. (3)

440. United States Foreign Policy. Formulation, execution, and impact. (5)

442. National Security and Global Politics. How intelligence systems function, fit within the policymaking systems of free societies, and are managed and controlled. (3)

443. National Security Policy. Decision-making options in U.S. defense programs. (3)

445. United States and Latin America. A study and analysis of the foreign relations of the Latin American nations among themselves and with the rest of the world. (4)

447. Foreign Policy in the Pacific. An analysis of the contemporary foreign policies of the major countries surrounding the North Pacific. (4)

448. United States Trade Policy. Examines U.S. trade policy in the twentieth century with particular attention paid to the GATT cooperative framework and dispute settlement. (4W)

450. Political Analysis. Political data, quantitative and analytical techniques. (4)

452. American Military History. History of the development of the American military establishment and its relationship to the changing American and global environment. (3W)

471. American Constitutional Law I. Governmental powers, separation of powers, checks and balances, federalism, and due process of law. (4F)

472. American Constitutional Law II. Equality and Bill of Rights protections. (4W)

473. Supreme Court Simulation. Simulation of Supreme Court. Instructor approval required. (5) ®

478. United States and the European Community. The study of diplomatic relations between Europe and the U.S. from World War I to the present. (3)

489. Special Topics in Political Science. Credit arranged. Prerequisite: instructor's consent. (1-5F,W,Sp,Su) ®

491. Readings and Conference. Individually directed study in subjects of special interest to students. Permission of instructor required. (1-5) ®

499. Senior Research Seminar. Introduces students to the research process by having them complete a major research project in the topic area of the particular professor. (4F,W,Sp) ®

516. Economic Transformation of Russia and Eastern Europe. Description and analysis of the contemporary economic systems of Russia and Eastern Europe, with emphasis on problems of economic policy and central planning. (3)

591. Campaign Internship. A quarter campaign internship. Instructor approval required. (2-15) ®

592. Washington Internship. A quarter congressional, administrative, or legal internship in Washington, D.C. Instructor approval required. (2-15) ®

593. State Government Internship. A quarter legislative, lobbying, or administrative internship in the state government of Utah or those of any other state government. Instructor approval required. (2-15) ®

594. Administrative Internship. A quarter administrative internship at the local or state level. Instructor approval required. (1-15) ®

Graduate[1]

601. Scope and Methods in Political Science. (4)

603. Political Theory, Political Economy, and Capitalism. (4)

604. Public Choice. (4)

610. Politics and Public Policy. (4)

612. Political Institutions in U.S. Government. (4)

614. Parties, Voters, and Elections. (4)

615. Political Incentives in United States Government. (4)

618. Natural Resources and Environmental Policy: Political Economy of Environmental Quality. (4)

622. International Political Economy. (4)

623. Political Change and Development: Middle East. (4)

625. International Trade Policy. (4)

627. Comparative Political Change/Development. (4)

628. Political Change and Development: Latin America. (4)

681. Seminar. (1-4) ®

691. Tutorial. (1-5) ®

692. Internship. Approval of instructor required. (1-15) ®

697. Thesis Research. (1-9)

699. Continuing Graduate Advisement. (1-3) ®

[1]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

Department of
Psychology
College of Education

Acting Head: Associate Professor David M. Stein

Office in Emma Eccles Jones Education 487E, 797-1460

Professors Frank R. Ascione, Keith T. Checketts, Carl D. Cheney, John R. Cragun, Marvin G. Fifield, Cecelia H. Foxley, J. Grayson Osborne, Richard N. Roberts, Charles L. Salzberg, Sebastian Striefel, Karl R. White, Blaine R. Worthen; **Professors Emeritus** Michael R. Bertoch, Glendon W. Casto, Arden N. Frandsen, Richard B. Powers, David R. Stone; **Associate Professors** Tamara J. Ferguson, Kenneth W. Merrell, Lani Marie Van Dusen; **Research Associate Professor** Byron R. Burnham; **Associate Professors Emeritus** William R. Dobson, Elwin C. Nielsen, Ronald S. Peterson; **Assistant Professors** Susan L. Crowley, Xitao Fan, Gretchen A. Gimpel, Kevin Masters; **Research Assistant Professors** Susan G. Friedman, Mark S. Innocenti; **Assistant Professor Emeritus** J. Whorton Allen; **Adjunct and Clinical Faculty** J. Milo Andrus, Ann M. Berghout Austin, Richard D. Baer, Carolyn G. Barcus, David W. Bush, Curtis R. Canning, Phyllis Cole, Mary E. Doty, Margaret M. Dyreson, Laura B. Fisher, Steven M. Gentry, Marilynne T. Glatfelter, Richard D. Gordin, Jr., Ronald Houston, Bruce R. Johns, Randall M. Jones, Joan Kleinke, Glen H. Maw, Mark A. Nafziger, John A. Neece, D. Kim Openshaw, Calvin R. Petersen, Lori A. Roggman, Patricia L. Truhn, JoAnn T. Tschanz, Leland J. Winger, Jr., Jean Wollam; **Adviser** Patricia O. Preston

Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA), Master of Science (MS), Master of Arts (MA), and Doctor of Philosophy (PhD) in Psychology

Areas of specialization: Graduate degrees are offered in School Counseling, School Psychology, Professional-Scientific Psychology (APA approved), and Research and Evaluation Methodology.

Objectives

One primary focus of the undergraduate major program in psychology is to prepare students for acceptance into graduate programs. A second focus is to prepare students for post-bachelor employment opportunities. Employment opportunities for students with a bachelor's degree in psychology are diverse. Although the department does not offer specific formal areas of concentration at the bachelor's level, other than the approved teaching major, listings of courses in psychology and related disciplines have been compiled to assist students in taking combinations of courses which can lead naturally to different employment opportunities.

More information on career alternatives and assistance in selecting electives appropriate to a student's career goals can be obtained from the Psychology undergraduate adviser in Emma Eccles Jones Education 475.

The department also offers undergraduate courses in the study of human and animal behavior and in research methods used by psychologists. These courses are pertinent to the education of students majoring in other areas. The department maintains both human and animal laboratories to supplement didactic coursework in the study of behavior.

Requirements

Departmental Admission Requirements. Students are admitted to the Department of Psychology as Pre-psychology majors by meeting the Utah State University admission requirements (see pages 8-11). To be a Psychology major, a student must make written application to the department, after meeting the following prerequisites: (1) completion of at least 70 quarter credits with a cumulative GPA of 2.5 or higher; (2) completion of the Learning Skills requirement, at least 20 credits of the Broadening Knowledge requirement, and at least 3 credits of the Written Communications requirement with a GPA of 2.5 or higher; and (3) completion of Psy 101, 140, and Psy 110 and/or 210 with a GPA of 2.75 or higher. Application to the department should be made during the quarter in which these prerequisites will be completed.

Psychology Major and Psychology Teaching Major. Requirements for a psychology major consist of a broad preparation of 34 credits of specified coursework, plus a minimum of 15 credits of approved Psychology elective courses and at least 6 credits of a culminating experience which allows for integration of coursework knowledge (theory) through application, for a total of 50-51 credits. The specific courses required are: Psy 101, 110 or 210, 140, 246, 251, 350, 380, 421, 442, 510, and 550. Approved Psychology elective courses are: Psy 110 or 210, 121, 221, 345, 366, 372, 440, 520, and 533. Teaching majors must complete **both** Psy 110 and 210. An academic minor **or** courses in a pre-approved area of concentration, totaling at least 27 credits, is required. An overall GPA of 2.5 minimum is required for graduation, with a minimum GPA of 2.75 in Psychology. Students desiring certification for teaching in secondary schools must also meet the requirements of the Secondary Education Department.

Psychology Minor and Psychology Teaching Minor. Requirements for the academic minor and teaching minor include: Psy 101, 110 or 210, 140, and 15-17 credits from Psychology courses listed for the major, for a total of 27-29 credits. Teaching minors must complete **both** Psy 110 and 210.

Graduate Study

The Department of Psychology offers certification for school psychologists and school counselors and the degrees of Master of Science and Doctor of Philosophy. Areas of specialization are Professional-Scientific Psychology and Research and Evaluation Methodology at the PhD level; and School Counseling and School Psychology at the MS level. See the *Graduate Catalog* for further information.

Psychology Courses

Note: No Psychology courses numbered above 300 may be taken until the student has been admitted as a Psychology Major, or has completed at least 90 quarter credits with a 2.5 GPA. However, students who have been admitted to the Teacher Education program may take Psy 366. No Psychology courses numbered above 400 may be taken until the student has been admitted as a Psychology Major or has completed at least 135 quarter credits with a GPA of 2.5 or higher.

SS 101. General Psychology. Principles of behavior of organisms including scientific methodology in psychology, conditioning and learning, perception and thinking, child development, personality, abnormal psychology, and social psychology. This course is the prerequisite for most undergraduate coursework in Psychology. (5F,W,Sp,Su) © [1,3]

SS 110. Human Development: General. Introduction to psychological development with emphasis on perceptual, language, cognitive, and social development in children. Prerequisite: Psy 101. (3-5F,W,Sp,Su) © [1,3]

SS 121. Psychology of Human Adjustment. An examination of the life situations that affect human adjustment to everyday living, with emphasis on practical application. Prerequisite: Psy 101. (3F,W,Sp) ©

122. Career Exploration. Designed to enable students of all disciplines and levels of educational attainment to explore their career interests and potential. (3F,W,Sp) ©

SS 140. Analysis of Behavior: Basic Principles. A laboratory course about the scientific methods used in the study of animal and human behavior. Prerequisite: Psy 101. (4F,W,Sp,Su)[1]

173. Personal Study Efficiency. Designed to (1) increase a student's interest in and knowledge of the University and (2) develop skills in areas such as note taking, listening, test taking, and textbook reading. (1-3F,W,Sp)

175. College Reading and Listening. A practical course, highly individualized, designed to aid in improving the efficiency of reading and listening skills. (2W)

210. Human Development: Adolescence. Characteristics of adolescents and their psychological, educational, and adjustmental problems are discussed in detail. Prerequisite: Psy 101. (3F,W,Sp)[1,3]

221. Abnormal Psychology. A descriptive and explanatory study of the varieties of psychoses, psychoneuroses, and minor maladjustments—their causes, methods of treatment, and approaches used in preventing psychological maladjustments. Prerequisite: Psy 101. (3F,Sp) © [1,3]

225. Introductory Cooperative Work Experience. Educators and employers cooperate to provide opportunities for students to apply classroom theory and principles in job environments, thereby gaining practical experience in their field. Prerequisite: approval of psychology department coop education coordinator. (1-8F,W,Sp,Su)[1] ®

246. Physiological Psychology. Introductory course in anatomy and physiology related to the central nervous system and behavior. Also considered are the neural and biochemical substrates of behavior. Prerequisites: Phyl 130 or equivalent, Psy 101. (3F)[1,3]

251. Social Psychology. Study of the individual in society; problems, theories, and methods of social psychology; will relate reading assignments to current social issues. Prerequisite: Psy 101. (3W,Su)[1,2]

300. Child Abuse and Neglect: A Multidisciplinary Approach. Goal is to equip students with an increased knowledge and awareness of the etiology, identification, reporting, and treatment of abused children and abusive parents. (3) ©

345. Perception and Psychophysics. Analysis of sensory-determined behavior and the methods, findings, and principles of sensory communication. Prerequisite: Psy 101. (3Sp)[1,2]

350. Scientific Thinking and Methods in Psychology. Overview of scientific thinking and research methods used in Psychology and other closely related social sciences. Prerequisite: Psy 101. (3W)[1,3]

366. Educational Psychology for Teachers. Principles and practices for development of conditions for effective learning. Prerequisites: Psy 101, and Psy 110 or 210. (3F,W,Sp,Su)[1,2]

372. Behavior Modification. Approaches to behavior modification in a variety of settings. An individual project is required of the student. Prerequisites: Psy 101 and 140. (3)

380. Introduction to Educational and Psychological Statistics. Elementary study of statistical procedures in handling test scores and other data, and of the concepts needed to read current educational and psychological literature. (3F,W,Sp,Su)[1,2]

421. Personality Theory. An explanatory study of various personality theories, their origin, and approaches to the understanding of human behavior. Prerequisite: Psy 101 and 380. (3) ©

425. Advanced Cooperative Work Experience. Cooperative education work experience position; increased level of complexity and a more professional level of experience as student advances toward completion of the program. Prerequisite: approval of Psychology Department cooperative education coordinator. (1-15F,W,Sp,Su) ® [1]

440. Analysis of Behavior: Learning, Motivation, and Emotion. In-depth examination of the principles introduced in Psy 140. Principles governing more

complex human and animal behavior are considered as well as emotional and motivational factors in behavior. Lab included. Prerequisite: Psy 140. (4)

442. Thinking and Verbal Learning. Stresses mediational processes in thinking, cognition, concept learning, transfer, and hypothesizing as elements of complex learning and problem solving. Prerequisite: Psy 101. (3)

480. Mental Aspects of Sports Performance. This course attempts to provide a current knowledge of sport psychology and the applications this knowledge has for teaching sports and coaching in public schools. (3W)

491. Undergraduate Research Creative Opportunity. A cooperative process of discovery, investigation, research, or creativity between faculty and one or more students. Prerequisite: approval of Psychology Department URCO coordinator. (1-3F,W,Sp,Su) ® [1]

492. Practicum. Field work in applied psychological settings at the BS level. (1-3)[1] ®

505 (d605).[4] Psychological Aspects of Sports Performance. Psychological theory and principles applied to sports. Includes motivational techniques, psychological evaluation, stress and anxiety in sports, personality and sports performance. (3Sp)

510 (d610). History and Systems of Psychology. Theoretical and historical developments in psychology with primary emphasis on nineteenth and twentieth century developments, although earlier precursors are also considered. Prerequisite: Psy 101. (4Sp)[1,2]

515. Psychology of Aging. To acquaint students with the psychological process changes in the elderly, the coping mechanisms used by the elderly, and the research related to the above. (4)

520. Introduction to Counseling and Guidance. An introduction to the fundamental counseling and guidance principles and theories that are applicable in various settings in which they are practiced. Prerequisite: Psy 101. (3)

533 (d633). Psychometrics. Evaluation, interpretation, and uses of tests of intelligence, aptitudes, interest, personality, and adjustment. Prerequisites: Psy 101, 380. (5F,Su)[1,2]

550. (d650). Interdisciplinary Workshop. (1-3) ®

590. Independent Study. Individual discussion and intensive study of a particular problem or area. Prerequisite: instructor's consent. (1-3F,W,Sp,Su) ® [1]

591. Independent Research. Experiments and demonstration projects are conducted and reported. Prerequisite: instructor's consent. (1-3F,W,Sp,Su) ® [1]

593. Instructional Apprenticeship. Training and practical experience in applying the techniques of contingency management to teaching. Prerequisite: instructor's consent. (1-3F,W,Sp,Su) ® [1]

Graduate[5]

601. Introduction to Evaluation: Evaluation Models and Practical Guidelines. (3F,Su)

605 (d505). Psychological Aspects of Sports Performance. (3Sp)

606. Human Development: Adult. (3)

610 (d510). History and Systems of Psychology. (4Sp)[1,2]

****615. Behavioral Assessment and Single-subject Analysis.** (3)

***616. Behavioral Treatment of Childhood Psychological Disorders.** (3)

620. Principles of Counseling and Psychotherapy. Prerequisite: BS degree in psychology or related field and acceptance into MS program in vocational rehabilitation, school counseling, or school psychology; or PhD program in clinical/counseling/school psychology. (3F,Su)[6]

****622. Group Counseling and Psychotherapy: Theory and Practice.** Prerequisites: Psy 620 and 635. (3)[6]

****623. Theories of Personality and Psychotherapy.** (3)

624. Workshop in Guidance. (1-6) ®

625. Graduate Cooperative Work Experience. (1-15F,W,Sp,Su) ®

****626. Career Development: Theory and Practice.** (3W)

***629. Nonstereotypic Approaches to Counseling.** Prerequisites: Psy 533/633, 620, 635 or consent of instructor. (3)[6]

630. Group Testing. Prerequisite: Psy 533/633 and instructor's consent. (3)[6]

631. Intellectual Assessment. Prerequisite: Psy 533/633 and instructor's consent. (3)[6]

****632. Psychological Assessment of Personality and Mood/Affect.** (3Sp)[6]

633 (d533). Psychometrics. Prerequisites: Psy 101, 380. (5F)

***634. Consultation and Group Processes: Intervention at the Systems Level.** (3F)[6]

635, 636, 637. Practicum in Counseling and Psychotherapy. Prerequisite: Psy 635 must be taken concurrently with Psy 620 unless the student has had a previous course in principles and techniques of counseling. Also, student must be accepted into MS school counseling or school psychology program or PhD professional-scientific psychology program. (3) (3) (3) ® [6]

641. Psychoeducational Assessment. Prerequisite: matriculation into MS progam in school psychology or PhD professional-scientific psychology program. (3)

646. Professional Issues in School Counseling and School Psychology. (3Su)

650 (d550). Interdisciplinary Workshop. (1-3) ®

654. Moral Development in the Family. (3)

657. Introduction to Educational and Psychological Research. Prerequisite: Psy 380. (3F,W,Sp,Su)

659. Psychology and the Deaf and Hard of Hearing. (3W)

660. Descriptive and Inferential Statistics I. Prerequisites: Psy 380, Educ/Psy 657 or Educ 655. (3F,W)

661. Descriptive and Inferential Statistics II. Prerequisite: Educ/Psy 660. (3W,Sp)

666. Principles of Learning. (3)

669. Solving Psychological and Educational Research Problems Through Computers. Prerequisite: Psy 660. (3Sp)

681. Seminar. (1-3) ®

688. Transcultural Assessment and Diagnosis. Prerequisite: instructor's consent. (1-3F,W,Sp,Su)

689. Assessment of Behavioral, Social, and Emotional Problems of Children and Adolescents. Prerequisite: instructor's consent. (3Sp)

690. Independent Study. (1-3F,W,Sp,Su) ®

691. Independent Research. Prerequisite: instructor's consent. (1-3F,W,Sp,Su) ®

693. University Teaching Apprenticeship. (1-3F,W,Sp,Su) ®

695. School Psychology Internship. (3F,W,Sp)

697. Thesis. (1-6F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

700. Research Designs in Educational and Psychological Research. Prerequisites: Educ/Psy 661 and Educ 677. (3Sp,Su)

702. Alternative Evaluation Methodologies. Prerequisite: Psy/Educ 601. (3)

703. Data Collection Techniques in Evaluation. Prerequisite: Psy/Educ 601. (3)

705. Internship in Program Evaluation. (1-6F,W,Sp,Su) ®

706. Internship in Research. (1-6) ®

707. Advanced Measurement Theories and Practice. (3W)

708. Application of Latent Variable Models in Research and Measurement. (3W)

710. Biological Basis of Behavior: Physiological. (3F)

711. Learning, Motivation, Cognition, and Emotion. (5F)

712. Developmental Psychology. (3W)

713. Social and Organizational Bases of Behavior. (5Sp)

725. Professional Ethics and Standards. (3F)

727 (f627). Psychopathology I. Prerequisite: instructor's consent. (3W)[6]

728 (f628). Psychopathology II. Prerequisite: Psy 727. (3Sp)[6]

****732. Advanced Psychological Assessment.** Prerequisite: Psy 632. (3Sp)[6]

735. Practicum in School Psychology. Prerequisite: permission of program chair. (3F,W,Sp,Su)[6] ®

736. Practicum in Counseling Psychology. Prerequisite: permission of program chair. (3F,W,Sp,Su)[6] ®

737. Practicum in Clinical Psychology. Prerequisite: permission of program chair. (3F,W,Sp,Su)[6] ®

747. Practicum Supervision. (1-3F,Sp)[6] ®

750. Interdisciplinary Workshop. (1-3Su) ®

767. Designing Educational and Psychological Research. Prerequisite: Educ/Psy 700. (3F,Su)

770 (f670). Grantsmanship in Education and Psychology. (3-5W)[6]

781. Seminar. (1-3)[6] ®

****782. Neuropsychological Assessment Workshop.** Prerequisite: Psy 632. (3)[6]

***784. Psychopharmacology.** Prerequisite: Psy 632. (2)[6]

790. Independent Study. (1-3F,W,Sp,Su) ®

791. Independent Research. (1-3F,W,Sp,Su) ®

795. Internship. (1-6F,W,Sp,Su) ® [6]

797. Dissertation. (1-18F,W,Sp,Su) ®

799. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

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[1]This course is also offered by COM-NET through Continuing Education.

[2]Taught by COM-NET 1996-97.

[3]Taught by COM-NET 1997-98.

[4]Parenthetical numbers preceded by *d* indicate a *dual* listing; parenthetical numbers preceded by an *f* are the *former* course numbers.

[5]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

[6]These courses can be taken only by psychology graduate students.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

*Taught 1996-97.

**Taught 1997-98.

Department of
Rangeland Resources

College of Natural Resources

Head: Professor John C. Malechek
Office in Natural Resources 210, 797-2471

Professors James E. Bowns, Martyn M. Caldwell, Frederick D. Provenza, Neil E. West, John P. Workman; **Adjunct Professor** Douglas A. Johnson; **Professors Emeritus** Thadis W. Box, Don D. Dwyer, Philip J. Urness; **Associate Professors** Roger E. Banner, Christopher A. Call, James P. Dobrowolski, Brien E. Norton, George Allen Rasmussen; **Adjunct Associate Professors** Kenneth C. Olson, James A. Pfister, Michael H. Ralphs; **Extension Associate Professor** Charles W. Gay (Assistant to the Dean for Administrative Affairs); **Assistant Professors** D. Layne Coppock, Eugene W. Schupp; **Adjunct Assistant Professors** Dale L. Bartos, Mark W. Brunson, Thomas A. Jones, Gregory K. Perrier, David A. Pyke; **State Collaborator** Dennis Austin

Degrees offered: Bachelor of Science (BS) with opportunity for Honors degree in Range Science, Master of Science (MS), and Doctor of Philosophy (PhD) in Range Science; MS and PhD in Ecology (Range)

Objectives

Courses and curricula in the department provide education and training that prepare students for a variety of careers related to rangeland resource management. These careers are usually with state agencies and the numerous federal land management and advisory agencies in the Departments of Agriculture and the Interior, but are increasingly with environmental consulting firms, real estate firms, banks, and large ranches.

Requirements

Departmental Admission Requirements. Admission requirements for the Department of Rangeland Resources are the same as those described for the College of Natural Resources on page 55.

Bachelor of Science in Range Science. Students entering the four-year program can select from a **Management Option** or a **Science Option**. Both options qualify the graduate for a professional career in natural resources management. The Science Option better prepares the student for an advanced degree (MS or PhD) in natural resources. Students in both options must complete basic courses in chemistry, mathematics, statistics, computer science, biology, and economics. Other required courses include ecology, plant taxonomy, plant physiology, and animal production and nutrition. All students are required to take courses in the Natural Resources core (NR 101, 102, 201, 360, 370, 380, and 390), and take FW 300, FR 300 (or RR 300), WS 420, and Geog 113 and 534. Required Rangeland Resources courses include RLR 199, 291, 300, 386, 445, 491, 541, 561, 563, 565, and 570. Students in the **Management Option** must complete a six-week Natural Resources summer camp (RLR 298; FR 301, 302, 303; and Geog/WS 301), which is required for graduation. Students in the **Science Option** take higher level mathematics and chemistry courses and a physics course instead of the summer camp requirement. Required written communication, approved General Education, and elective courses make a total of 16 to 18 credits per quarter.

Minor in Range Science (24 credits). RLR 300, 445, 541, 561, 565, and 570 are required, along with approval from the department head, for a minor in Range Science.

Special Interest Areas. Approved coursework is available for the following special interest areas: forest-range management; range-watershed management; range economics; range-wildlife relations; range rehabilitation; and international range management. Courses for areas of special interest are in addition to those courses normally required for either the Management Option or the Science Option, and will require at least two additional quarters of study. Students interested in these areas should consult with their academic adviser.

Graduate Study

The department offers the Master of Science and Doctor of Philosophy degrees with specialization in range management, range ecology, range animal nutrition, range economics, game-range management, range rehabilitation, and international

range management. See the *Graduate Catalog* for requirements and further information.

Rangeland Resources Courses

Natural Resources courses 101 through 645 are listed under the College of Natural Resources, pages 55-56.

199. Orientation Seminar for Students Entering the Rangeland Resources Department. Orientation to the profession of Range Science and Management and the Rangeland Resources Department. (1F)

LS 284. General Ecology. Interrelationships between organisms and their environments at levels of individual organisms, species populations, and ecosystems; emphasis on structure and function of latter two; human implications. Suitable for nonbiologists. (5F,Sp,Su)

291. Professional Leadership Seminar. Development of professional leadership skills, including organization and conduct of meetings, parliamentary procedure, and team building. (1W)

298. Range Analysis. Field identification of summer range plants. Methods and techniques of vegetation analysis. Practice in range allotment analysis. (2 Summer Camp)

300. Principles of Range Management. Application of ecological and social principles to the management of rangelands. Emphasizes natural development, classification, evaluation, and multiple use of rangelands, plant ecology, animal nutrition and ecology, and conflict management related to resource use. (3F,Sp)

386. General Ecology for Life Science Majors. Interrelationships among microorganisms, plants, and animals and their environments at the level of individual organisms; species populations and ecosystems with emphasis on the structure and function of the latter two, and human implications. (4F,W)

425. Advanced Internship/Co-op. An internship/cooperative education work experience; increased complexity to help student gain a more professional level of experience. (1-15F,W,Sp,Su) ®

445. Grassland and Desert Range Plants. Identification, ecology, and uses of range plants of deserts and grasslands of Western North America. Lab fee. Prerequisites: RLR 300, 386; Bot 420. (3Sp)

480. Undergraduate Research. Individual or team research. Prerequisite: adviser approval. (1-5F,W,Sp,Su) ®

490. Readings and Conference. (1-6F,W,Sp,Su) ®

491. Range Issues Seminar. Supervised discussion and review of range resource topics. Prerequisite: Range Science graduating senior. (2Sp) ®

492. Honors Readings. Assigned readings in philosophy of range science and management strategies; discussion sessions by arrangement with supervising faculty. Prerequisite: enrollment in the Range Science honors program. (1-3F,W,Sp,Su)

495. Range Problems. Individual study and research upon selected problems in range science and related subjects. Prerequisite: faculty approval. (1-3F,W,Sp,Su) ®

497. Range Ecology and Management—Field Study. Extended field trips and studies of the ecology and management of North American rangelands. Special fees and permission of instructor required. (1-5F,W,Sp,Su) ®

507 (d607).[1] Range Wildlife Relations. A senior, graduate course that explores interactions on rangelands between wild and domestic ungulates, as well as other wildlife forms around the world, but with emphasis on western North America. Prerequisite: RLR 300. (4W)

****508. Rehabilitation of Drastically Disturbed Arid Land.** Considers scientific principles, analysis of problems, and application of methods for rehabilitating drastically disturbed lands with an emphasis on the arid West. Prerequisites: RLR 300, 386. (3F,Sp)

510. Conflict Management in Natural Resources. Introduction to conflict management techniques for those involved in natural resources. Includes active class participation in learning to deal with natural resource conflicts. (3Sp)

***522. Tropical Savanna Ecosystems.** Worldwide survey; influences of fire, grazing, and drought on productivity and structure in relation to utilization by wildlife and domestic livestock; techniques for manipulation or improvement. (3Sp)

***523. International Extension Planning and Appropriate Technology.** Discussions and readings that explore the institutional and organizational requirements necessary for planning and implementing successful natural resources related programs. Prerequisites: RLR 529, 563. (3W)

***524. Range Management Project Planning and Implementation in Developing Nations.** Describes planning processes and surveys natural resources management project activity in LDCs of major world aid donors. Discusses project implementation problems and solutions. Prerequisite: RLR 300. (4Sp)

***529. Range Management in Pastoral Societies.** Strategies for sustained utilization of rangelands and related resources by pastoral peoples living in various climatic zones, biogeographical regions, and cultural systems. Prerequisite: RLR 300. (3F)

541. Range Vegetation Analysis for Livestock and Wildlife. Methods and analytical procedures for measuring and assessing vegetation used by livestock and wildlife as forage and cover. Lab fee. Prerequisites: RLR 300 and 386; Stat 201. (5F)

561. Wildland Ecosystems. Structure, function, dynamics, and management of wildland ecosystems, with emphasis on those of North America. Prerequisites: RLR 386, general soils, plant taxonomy, and College of Natural Resources summer camp. (5W)

563. Range Vegetation Manipulation and Management. Changing composition and improving productivity of range vegetation for multiple uses by use of biological, chemical, mechanical, and pyric methods. Prerequisites: RLR 300, 386; and College of Natural Resources summer camp. (4W)

565. Range Resource Economics. Principles of production economics as they apply to problems encountered in the use of natural resources. Emphasis is on the application of economic principles to problems in managing private and public range resources. Prerequisites: Econ 200, RLR 300, NR 380. (3F)

568. Rangeland Appraisal. The systematic process of determining the fair market (dollar) value of range resources used for livestock, big game, water, recreation, cropping, and development purposes. Prerequisite: prior or concurrent registration in RLR 565 or equivalent. (3F)

570. Range Inventory and Management Planning. Inventory of soils, vegetation, water, wildlife, and recreation resources of a selected ranch operation and development of a detailed management plan. Techniques apply to management of private and public lands. Prerequisites: RLR 563, 565; College of Natural Resources summer camp; and range science graduating senior. (5Sp)

575. Geographic Applications of Remote Sensing. Provides information needed to understand and apply the techniques of remote sensing to a wide range of resource applications. (3)

****586. Poisonous Range Plants Affecting Livestock.** Poisonous plants of rangelands and their effects on grazing animals, especially livestock. Management practices to reduce or prevent poisoning. (3W)

Graduate[2]

600. Management of Rangelands for Grazing. Prerequisite: RLR 300. (4W)

607 (d507). Range Wildlife Relations. Prerequisite: RLR 300. (4W)

615. Stress Physiology of Rangeland Plants. Prerequisite: Bot 440 or equivalent. (4Sp)

****642. Vegetation Analysis.** Prerequisites: RLR 541 or equivalent, Stat 301 and 502, CS 241. (4Sp)

655. Synecology. Prerequisite: introductory ecology and soils. (3W)

680. Seminar. (1F,W,Sp) ®

681 (f598). International Range Management Seminar. (1) ®

687. Ecology Seminar. (1) ®

690. Readings and Conference. (1-3F,W,Sp,Su) ®

691. Special Topics in Range Science. (1-3) ®

692. Special Topics in Ecology. (1-3) ®

693. Special Topics in Physiological Ecology. (1-3) ®

694. Special Topics in Range Wildlife Relations. (1-3) ®

697. Thesis Research. (1-15) ®

699. Continuing Graduate Advisement. (1-3) ®

****703 (f603). Plant-Herbivore Interactions.** (4W)

715 (f610). Physiological Ecology of Plants. (4F)

721 (f621). Physiological Ecology of Plants Practicum. (2W)

730 (f630). Population Ecology of Plants. (4W)

731. Developing Careers in Research. (2W)

****742 (f641). Vegetation Classification/Ordination.** (3Sp)

***765 (f665). Range Economic Analysis.** Prerequisite: RLR 565. (2W)

775 (f675). Range Animal Nutrition. (3F)

776. Techniques in Range Animal Nutrition Research. (2F)

797. Dissertation Research. (1-15) ®

799. Continuing Graduate Advisement. (1-3) ®

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[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

*Taught 1996-97.

**Taught 1997-98.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Department of Secondary Education

College of Education

Head: Professor William J. Strong
Office in Emma Eccles Jones Education 330, 797-2222

Professors James S. Cangelosi, Michael W. Heikkinen, Richard S. Knight, Izar A. Martinez, Walter L. Saunders, James P. Shaver; **Professors Emeritus** Ross R. Allen, Eldon M. Drake, Kenneth C. Farrer; **Associate Professor** Kay Camperell; **Associate Professor Emeritus** Varnell A. Bench; **Assistant Professors** Grace C. Huerta, Dalphia R. Pierce; **Senior Lecturer** Ronald K. Drickey; **Lecturer** Patricia T. Stoddart; **Undergraduate Adviser** Harold E. Heap

Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA), Master of Science (MS), Master of Arts (MA), and Master of Education (MEd) in Secondary Education; participates in the Interdepartmental Doctor of Education (EdD) and Doctor of Philosophy (PhD)

Objectives

The function of the Department of Secondary Education is to aid in the preparation of teachers, supervisors, curriculum specialists, and other professional personnel for careers in secondary education.

Requirements

Departmental Admission Requirements. With the exception of GPA (2.75 cumulative required), admission requirements for the Department of Secondary Education are the same as those described for the University on pages 8-11. Students in good standing may apply for admission to the department. See also requirements for admission to teacher education.

Bachelor of Science in Secondary Education. For the degree the student must complete: (1) 52 credits of General Education requirements, including the written communications requirement; (2) an approved teaching major and approved teaching minor or an approved composite teaching major; (3) the Professional Education component (51 credits minimum); and (4) 0-14 credits of electives. Upon meeting these requirements, the student is also eligible to apply for a teaching certificate in secondary education. This certificate qualifies the candidate to teach at the junior and senior high school levels (grades 6-12).

Certificate in Secondary Education. Students who are completing an academic major or have been awarded an undergraduate degree and wish to certify in secondary education must meet requirements 2 and 3 above.

Teaching Major and Minor or Composite Major. Teaching majors, minors, and composite majors are offered in most subject areas in which there are classes taught in the secondary schools of Utah. The following composites, majors, and minors have been approved by the Utah State Board of Education as subject areas in teacher education at USU:

Composite Teaching Majors—69 credits minimum. Agricultural Education, Art Education, Biological Science, Business Education, Earth Science, English, Family and Consumer Sciences Education, Industrial and Technical Education, Marketing Education, Music Education, Physical Science, and Social Studies.

Teaching Majors—45 credits minimum. Chemistry, Dance, Economics, English, Geography, Health Education, History, Journalism, Mathematics, Modern Languages, Physical Education (K-12), Physics, Political Science, Psychology, Sociology, and Theatre Arts.

Teaching Minors—24 credits minimum. Biology, Business Computer and Information Systems, Business Education, Chemistry, Computer Education, Dance, Economics, English, Geography, Health Education, History, Journalism, Marketing Education, Mathematics, Modern Languages, Physical Education—Coaching, Physics, Political Science, Psychology, Sociology, Speech, and Theatre Arts.

For a listing of course requirements for majors, minors, and composites see the *USU Secondary Teacher Education Program Undergraduate Planning Guide* available from advising offices in departments across campus and from the Department of Secondary Education.

Several departments offering composite or teaching majors require students to graduate from their college and department. These majors are Agricultural Education, Art Education, Business

Education, Marketing Education, Family and Consumer Sciences Education, Industrial and Technical Education, Music Education, and Physical and Health Education. Students majoring in other areas may graduate in either the department offering the major or the Department of Secondary Education. Identical requirements must be met in either case.

Admission to Teacher Education. Regardless of the department in which the student majors, he or she must apply for and be granted permission to enter the teacher education program by the College of Education prior to enrolling in most education courses. Criteria for admission include performance on ACT and/or meeting specific General Education requirements, a minimum competency in the teaching subject area, overall grade point average, and successful completion of the orientation course. A speech and hearing test and a writing proficiency test are also required. Students should make the application for admission to teacher education after completion of 90 credits. Applications are available from all departmental advisers.

Professional Education Component. Students must complete the following courses: ScEd 201, 301, 302, 404, 450, 460, 510; Psy 366; SpEd 301; and InsT 445, 447. Students in Agricultural Education, Art Education, Business Education, Marketing Education, Family and Consumer Sciences, Industrial Technology and Education, and Physical and Health Education meet the requirements for ScEd 201, 450, and 460 in different ways. These students should consult with their advisers. Students must also complete Special Teaching Methods courses both in the major and in the minor (if different from the major). See adviser for appropriate Teaching Methods information.

The student is advised to complete the Professional Education Component in sequence during the junior and senior years and concurrently with coursework in the academic areas. See major requirement sheet, available from the major department or the Secondary Education Department, for proper sequence of courses. The special methods course(s) should be completed just prior to student teaching, as schedules permit. ScEd 450 and 460, the seminar and student teaching experience, are to be taken concurrently during the senior year, preferably during fall or winter quarter.

Student Teaching. The student teaching experience will require a substantial commitment of time and energy. The candidate will spend all day teaching in a public secondary school for the entire quarter. The student teaching quarter should be carefully planned with the student's adviser.

Applications for student teaching must be submitted to the Field Experiences Office, Emma Eccles Jones Education 330, by the following deadlines: fall quarter, April 15; winter quarter, October 15; and spring quarter, January 15. The student should be financially prepared to stay off campus, if necessary, during the student teaching quarter.

Background Check. As a result of legislative mandate, all applicants for student teaching will be subjected to a criminal background check prior to student teaching placement. The Office of Field Experiences, Emma Eccles Jones 330, will assist students in complying with this mandate. The fee for the background check, payable *only* by money order to the Utah State Office of Education, is $10.

Application for Teaching Certificate. In order to receive a Utah Teaching Certificate, the student must apply for the Basic Teaching Certificate at the Teacher Education Office, Emma Eccles Jones Education 103, during the last quarter of the senior year. Secondary Teacher Certification is not automatic upon the completion of the program.

Elementary Education Dual Certification. To qualify for a secondary certificate, in addition to meeting requirements for the elementary certificate, candidates must: (1) complete the requirements for a composite teaching major or for a teaching major and minor as indicated above, and (2) complete the professional education component in secondary education, including special methods courses in the teaching major and teaching minor and student teaching at the secondary school level.

Special Education Dual Certification. Students can be certified in both special education and a secondary subject through a dual certification program offered by the departments of Secondary Education and Special Education.

A student desiring to obtain both the secondary and elementary or special education certificate should consult with an adviser in both Secondary Education and Special Education early in his or her program.

Graduate Study

The Department of Secondary Education, as an integral part of the College of Education, assists in the preparation of graduate students seeking the MEd, MA, and MS degrees, and the EdD and PhD degrees. Students desiring information concerning the various graduate programs should consult with the department head and write to the School of Graduate Studies for a *Graduate Catalog* which contains the details on the various graduate programs. Application for admission to a graduate program is made through the School of Graduate Studies.

Secondary Education Courses

201. Orientation to Teaching. Provides initial, objective information about the teaching profession, including opportunities for self assessment and career exploration. A field experience is an integral part of the course. (3F,W,Sp)

301. Teaching Strategies. Preservice teachers develop systematic strategies for organizing, designing, conducting, and managing lessons for classes of middle and secondary school students. (3F,W,Sp,Su)

302. Foundations of Education. Introductory studies of the historical, philosophical, psychological, and social foundations of secondary education with attention given to roles and responsibilities of contemporary teachers. (3F,W,Sp,Su)

303. Field-based Experiences for Pre-service Teachers in Secondary Schools. Field-based experiences in middle, junior, and senior high schools designed to acquaint pre-service teachers with managerial, clerical, instructional, and/or tutoring tasks. (1-3F,W,Sp)

306. Writing and Teaching. A writing course for prospective teachers about subjects related to teaching. For upper-division students who have completed a 200-level writing course or its equivalent. (3W)

310. Teaching Social Studies. A methods course for secondary school teachers with teaching majors or minors in any of the social sciences. Prerequisites: ScEd 301 and Psy 366. (4F,W,Sp)

320. Teaching English. Considers the content of the English curriculum, effective methods, and significant trends. Prerequisites: ScEd 301 and Psy 366. (4F,Sp)

330. Teaching Science. Objectives of science education. Curriculum materials to achieve these aims. Class members participate in video laboratory experiences and secondary school presentations. Prerequisites: ScEd 301, 335 and Psy 366. (4F,W)

335 (d535).[1] Laboratory Practicum for Secondary Science Teachers. Preservice and inservice science teachers are involved in the design, practice, and performance of science teaching demonstrations and investigative laboratory activities appropriate for secondary school science. May be repeated for credit once. (3W,Sp) ®

404. Evaluation of Student Achievement. Principles and techniques for developing useful measures of student achievement, interpreting test results, and reporting evaluations. Prerequisites: ScEd 301 and Psy 366 or permission of instructor. (3F,W,Sp,Su)

450. Student Teaching Seminar. Focus upon problems arising during student teaching. Includes teaching plans, procedures, adaptive classroom practices, and evaluation. To be taken concurrently with ScEd 460. (3F,W,Sp) ®

460. Student Teaching in Secondary Schools. Candidates assigned to cooperating teachers in the public secondary schools in their major and/or minor subjects. Students will have professional responsibilities associated with teaching. (12F,W,Sp)

465. Modified Student Teaching. Candidates assigned to cooperating teacher in a public secondary school. Only for those students seeking dual certification earning one-half of their student teaching credit in secondary education. (3-9F,W,Sp)

466. Internship. Provides advanced practical teaching experience under combined public school and University supervision. (3-6F,W,Sp) ®

490H. Senior Thesis. Student-initiated research project under faculty supervision. Prerequisites: satisfactory grade point average, instructor recommendation, and approval of Departmental Honors Committee. (1-9F,W,Sp)

500 (d600). Managing Student Behavior. Theory and application of basic principles for responsible student behavior in school. (3W,Su)

510. Content Area Reading/Writing. A performance-based class focused on ways to help teachers improve comprehension, study skills, and critical thinking of students through "across the curriculum" reading/writing activities. Prerequisites: ScEd 301 and Psy 366. (4F,W,Sp,Su)

535 (d335). Laboratory Practicum for Secondary Science Teachers. Preservice and inservice science teachers are involved in the design, practice, and performance of science teaching demonstrations and investigative laboratory activities appropriate for secondary school science. May be repeated for credit once. (3W,Sp) ®

556. Practicum in Improving School System Programs. A seminar focused upon a phase of the instruction program, upon a sequence of developmental training programs, upon new and persisting problems in the many dimensions of teaching. Not applicable for credit in degree programs. (1-6) ®

590. Independent Study. (1-3) ®

Graduate[2]

600 (d500). Managing Student Behavior. (3)

604. Measurement and Evaluation in Education. (3W,Su)

612. Reading at the Middle/Secondary School Level. (3W,Su)

614. Basic Processes of Reading. (3Su)

615. Foundations of Curriculum Development. (3)

619. Theories of Teaching in Public Schools. (3)

620. Middle School-Junior High Curriculum. (3)

624. Current Problems in Secondary Education. (3)

630. English Curriculum and Instruction. (3)

632. Workshop in English Curriculum. (3)

633. Supervision and Administration Internship. (3) ®

635. Social Studies Curriculum and Instruction. (3)

638 (f538). Character and Values Education. (2-3Su)

640. Science Curriculum and Instruction. (3)

644. Creative Education. (See ElEd 644.) (3W,Su)

645. Mathematics Curriculum and Instruction. (3)

646. Education of the Gifted and Talented. (See ElEd 646.) (3)

647. Identification and Evaluation in Gifted Education. (See ElEd 647.) (3)

648. Materials and Methods in Gifted Education. (See ElEd 648.) (3)

649. Supervised Practicum in Gifted Education. (3-6F,W,Sp,Su)

656. Practicum in Improvement of Instruction. (1-9) ®

670. Cross-Cultural Education and International Understanding. (3)

671. Multicultural Education. (3W)

690. Independent Study. (1-3F,W,Sp,Su) ®

691. Independent Research. (1-3F,W,Sp,Su) ®

696. Master's Project. (3-6F,W,Sp,Su)

697. Thesis. (3-9F,W,Sp,Su) ®

699. Continuing Graduate Advisement. (1-12) ®

705. Internship in Program Evaluation. (1-6) ®

706. Internship in Research. (1-6) ®

712. Student Teaching Supervision. (3)

733. Supervision Internship. (3-12)

735. Internship in Curriculum Development. (3) ®

781. Research Seminar. (1) ®

790. Independent Study. (1-3) ®

791. Independent Research. (1-3) ®

797. Dissertation. (1-18) ®

799. Continuing Graduate Advisement. (1-12) ®

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[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Department of

Sociology, Social Work and Anthropology

College of Humanities, Arts and Social Sciences

Head: Professor Gary H. Kiger
Assistant Head: Professor Richard S. Krannich
Office in Main 224, 797-1230

Professors Richley H. Crapo, H. Reed Geertsen, Yun Kim, David F. Lancy, Ann Leffler, Ronald L. Little, Jon R. Moris, Bradley W. Parlin, Brian L. Pitcher, Pamela J. Riley, David L. Rogers, William F. Stinner, Michael B. Toney; **Professors Emeritus** Wade H. Andrews, Therel R. Black, H. Bruce Bylund, William A. DeHart, Gordon N. Keller, Wesley T. Maughan, Alison C. Thorne; **Associate Professors** E. Helen Berry, Susan E. Dawson, Gary E. Madsen, Derek T. Mason, Steven R. Simms; **Adjunct Associate Professor** Dale J. Blahna; **Assistant Professors** Marcia D. Calloway, Bonnie Glass-Coffin, Terry L. Peak, Audrey M. Shillington; **Temporary Assistant Professor** Harry A. Ford; **Adjunct Assistant Professors** Nazih Al-Rashid, Lisa V. Bardwell, Joanna L. Endter-Wada, Sue H. Guenter-Schlesinger, Don C. Larson, Janet L. Osborne, Bryan R. Spykerman; **Research Assistant Professor** William B. Fawcett; **Assistant Professor Emeritus** Alice C. Smith

Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA), Master of Science (MS), Master of Arts (MA), and Doctor of Philosophy (PhD) in Sociology; BS and BA in Social Work; participates in Master of Social Science (MSS); BS and BA in Anthropology

Objectives

The department offers educational programs for students to prepare for positions in business, social welfare, teaching, research, personnel, government service, law enforcement, and industry, as well as providing liberal and general education for all interested students. The program offers a wide range of courses for the study of social, cultural, and behavioral dynamics. The department also provides General Education, Liberal Arts and Sciences, and other service courses for students from all majors.

Departmental Admission Requirements. Admission requirements for incoming students in Anthropology are the same as those described for the University. Students in good standing may apply for admission to the department, but must have a 2.5 GPA in all courses being applied toward the major. Applicants to the sociology major must have a 2.2 overall GPA and must have a 2.5 GPA in all courses applied toward the major. Applicants to the social work major must have completed the basic social work core curriculum, must have a 2.5 overall GPA and a 2.75 GPA in social work classes, must have completed SW 105 with a grade of *C+* or better, and must have completed an application form (available from the department).

Sociology

The study of the human individual and human groups is central to Sociology. These subjects offer a broad foundation for understanding human behavior on an individual and group basis and encourage the development of skills necessary for establishing favorable societal conditions for human development.

Sociology attempts to systematically describe and explain group behavior, including the effects of one group on another and of groups upon individual behavior. Required sociology classes deal with how people in different societies organize and control their societies, critical issues in sociology as they have developed through history, and statistical methods for analyzing sociological data.

Students select courses from four different areas. Modern problems classes focus on retirement and other aspects of aging, the causes and prevention of juvenile delinquency, the cultural characteristics of minority groups, and the treatment of mental illness. Group processes courses look at collective behavior, the organization of communities, the development of sex roles, and consumer behavior. Human institutions courses cover the demands of industries on humans and family, economic systems, educational systems, and social inequality. Demography and human ecology courses deal with the effects of the environment on human behavior and the consequences of different patterns of population growth and settlement. A Law and Society Area Studies Certificate is available. A teaching major in Sociology is available for students wishing to teach in the secondary schools.

Surveys of graduates indicate that sociology majors pursue a wide range of occupations. About one-third are employed in the professional sector, while close to one-fourth are in service occupations. In addition, 26 percent are involved in sales or management/administration. In terms of specific job titles, social service is a popular option, as is retail sales and teaching. Other frequent job titles include: vocational rehabilitation counselor, research analyst, data coordinator, management analyst, district sales manager, parole officer, juvenile probation officer, social services director, civil service test examiner, personnel director, insurance salesman, and correctional service officer. A variety of government and business positions are also expanding for sociology majors with the new emphasis on a liberal arts education. The growing awareness of the value of sociological perspectives for problem-solving continues to provide an increasing range of opportunities for employment in a variety of work settings.

Requirements

Sociology majors must meet the following course requirements:

1. Complete the general requirements of the University (a suggested schedule of courses to meet these requirements is available from the department's secretary or from the student's adviser). Students are expected to meet the requirements for a Liberal Arts and Sciences certificate (Broadening Knowledge

Option II), unless they have already accumulated 45 or more credits from another institution upon entering the program or unless they transfer from another major at USU.

2. Complete a minimum of 47 credits within the department. This is exclusive of any department course used to fill General Education or LASP requirements. Sociology majors must maintain a grade point average of 2.5 in courses within the department. A grade of *C-* or better must be achieved in courses counted for the major.

3. Completion of a minimum of 18 credits as specified by any outside department, as a minor field of interest, is encouraged but not required.

4. Complete the following required courses: Soc 101, 311, 312, and 401.

5. Choose a minimum of 33 credit hours from the following departmental elective courses. Any sociology course taught by the department may be included as an elective, but a student must have at least 6 credits from each of the three areas listed below. In addition, a combined total of only 6 credits of approved coursework in social work and in anthropology may count toward the sociology elective credits.

a. Modern Problems Area: Soc 140[1], 240 (or SW 240), 275, 341, 342, 343, 442, 443, 475, 480; Anth 461.

b. Groups and Institutions Area: Soc 102 or Anth 102, Soc 238, 330[1], 332, 333, 350[1], 352, 425, 433, 437[1], 452, 472, 480; SW 535; Anth 505.

c. Demography and Ecology Area: Soc 160, 320[1], 360, 361, 420, 462[1], 463, 465, 473, 480; Anth 452.

Sociology and Social Work Dual Major. Sociology majors who desire additional preparation for employment in the social services may take a dual major in sociology and social work. With the help of advisers, students who will seek positions in other special areas could include appropriately related courses.

Minor. Students minoring in sociology must have a minimum of 20 credits in Sociology courses. Soc 101 is required and the following courses are recommended: Soc 140, 320, 330, 350, and 437.

Teaching Certificate. Sociology is defined as an approved teaching major in Utah Secondary Schools by the State Board of Education. The sociology major must have as a minor a subject which is required in Utah high schools. In addition to completing the courses required for the sociology major, the sociology teaching major must also complete the required teaching certificate courses in education. Students can also elect sociology as an approved teaching minor.

Law and Society Area Studies. The Department of Sociology, Social Work and Anthropology sponsors an interdisciplinary program which emphasizes the study of the relationship between law and society. Students must complete 36 credits in at least three disciplines from a selected list of courses and maintain a 3.0 GPA in those courses.

The selected courses are: Comm 513; Hist 545; MHR 299; Phil 415; PolS 120, 313, 316, 380, 471, 472; SW 240, 300, 535; Soc 140, 341, 342, 343, 442, 443; SpEd 507. Only 18 credits may be selected from a single discipline. The Law and Society Area Studies program is pursued in conjunction with a major. Credits may apply to the area studies requirements as well as to a major. A student's transcript will reflect the Law and Society Area Studies emphasis upon completion of requirements for a degree.

[1]These courses are highly recommended as each gives an overview of the general subject area.

More information may be obtained from the department or from the Science/HASS Advising Center, Student Center 304.

Gerontology Program. The Department of Sociology, Social Work and Anthropology is one of several departments sponsoring an interdisciplinary gerontology program which prepares students for careers in the field of aging. Students may earn a certificate in gerontology by completing a selected list of course requirements (24 credits). This includes 180 clock hours of supervised field practicum in a gerontological setting.

More information concerning the gerontology certification program may be obtained from the Department of Family and Human Development.

American Studies Major. The Department of Sociology, Social Work and Anthropology is one of several departments offering an area of concentration for the American Studies program. The student who wishes to focus his or her work in American culture should refer to the American Studies program description (see listing under English Department) and check with the Sociology Department for further information.

Graduate Study

The department offers courses leading to the Master of Science, Master of Arts, and Doctor of Philosophy degrees in sociology, and the Master of Social Sciences degree. (See the *Graduate Catalog* for further information.) Seniors are advised to take the Graduate Record Examination in anticipation of graduate study and other special opportunities.

Sociology Courses

SS 101. Introductory Sociology. How people become human. How and why people of different cultures control their societies, evaluate their behavior, and organize as they do. (5F,W,Sp) ©

SS 102. American Culture. Basic beliefs, values, customs, and institutions of America. (3F,Sp)

SS 140. Modern Social Problems. Major American social problems. Adjustments and changes as a means of minimizing disorganization. (3F,W,Sp,Su)

160. Rural Sociology. Patterns of settlement and their influence upon rural life. Rural institutions and adjustments to meet rural problems. (3F)

IO 238. Gender Roles in American Society. An examination of the socialization of females and males for their expected roles in American society. (3F,W,Sp)

240. Social Welfare and Minority Groups. Examines social and cultural characteristics of various minority groups and emphasizes the use of social welfare resources for finding solutions to minority group problems. (3F)

275. Introduction to Study of Aging. Introduces the student to the general field of aging. Biological, psychological, and sociological aspects of aging will be emphasized. (3)

311. Methods of Social Research. Methods and techniques of analyzing and interpreting social data. (3F,W)

312. Social Statistics I. Levels of measurement; measure of central tendency dispersion and association; probability, the normal curve, statistical inference. (3F,W,Sp)

320. Population and Society. Growth and changing patterns of the population and socioeconomic and other factors related to population change. The significance of these population changes on today's living. (3F) ©

330. Social Change. A systematic analysis of society with emphasis on understanding the change process and alternative strategies for effecting change. (3)

332. Sociology of Work. Stresses contribution of sociology to the understanding of industry as a social system. Includes work behavior and impact of technology change on society. (3)

333. Medical Sociology. Examines the basic contributions of sociology to the field of medicine. An essential course for anyone contemplating a career in a health-related field. (3W)

341. Juvenile Delinquency. The nature, extent, causes, and treatment of delinquency. Programs of delinquency prevention are explored. (3) ©

342. Criminology. A social analysis of the crime problem in the U.S. Characteristics and causes of crime as well as social and legal reactions. (3) ©

343. Cults and Countercultures. An examination of lifestyles, deviance, and social control in the counterculture. (3)

350. Social Psychology. Cultural and social determinants of personality growth. Application of such knowledge to the understanding of group process, mass behavior, and the human relations problems. (3)

352. Collective Behavior. A study of sociological conditions that give rise to various types of social movements, and the role of social movements in changing society. (3)

360. Urban Sociology. The changing nature of social life as it has moved from predominantly rural to urban patterns. Significant events that have led to urbanization. (3)

361. Human Ecology. Social, cultural, and natural-spatial factors affecting the distribution of modern human society. Relationship of social behavior to the physical environment and resources. (3W)

401. Contemporary Sociological Theory. Advanced course for sociology majors dealing with leading theorists and schools of theory in contemporary sociology. (3)

420. World Population Problems. Current and future population problems, particularly in less developed areas of the world. Factors affecting population growth and change. (3)

425. Work Co-op. Cooperative education work experience in sociology. (1-15F,W,Sp) ®

433. Religion and Society. Potential influences of religion on our schools, sexual relations, family lives, and foreign policies. Addresses how these and other areas of our society influence religion. (3)

437. Social Inequality. Nature and consequences of the differential distribution of rewards and prestige in our own society and in other societies. (3)

442. The Criminal Justice System. A sociological analysis of the criminal courts, law enforcement, and prisons. Alternatives to current practice are examined. (3)

443. Law and Society. Relationship between both civil and criminal law to power, morality, interest groups, social control, and social change. (3)

446 (d646).[1] Sociology of Health. Examination of the social and cultural factors which influence health. Health behaviors are analyzed as consequences of a variety of diverse personal and social processes. (3)

452. Group Dynamics. Group processes from the point of view of improving individual groups. Social action as a group process. (3)

****462. Sociology of Natural Resources.** For students interested in the social organization and social systems associated with natural resources. Includes principles and a field of study of resource problems. (3)

****463. Social Impact Assessment.** Theoretical and methodological problems of social impact assessment. Government policy processes are increasingly mandating social impact assessments to evaluate policy. (3)

****465 (d665). Developing Societies.** Theories and experiences of social, political, and economic development with emphasis on the problems of developing countries. (3)

472. Community Organization and Leadership. To assist the student to gain an understanding of sociological pressures within and outside the community that affect courses of decision making and action. (3)

****473 (d673). Women in International Development.** Focuses on status of women in developing countries and the role they play in the development process. (3)

***474. Women in Asian Societies.** Explores the social position of women in contemporary Asia and their adaptation to rapid economic, political, and cultural change. Emphasizes women's access to social and economic resources. (3Sp)

475. The Sociology of Aging. Course examines social adjustments of aging; i.e., special problems relating to retirement, public attitudes, the myths about aging, and role or place in society. (3)

480. Seminar in Sociology. Seminars in various areas of sociology: (a) theory, (b) methodology, (c) demography, (d) social organization, (e) social deviance, (f) social psychology, (g) human ecology, (h) gerontology. Instructor's permission required. (1-3F,W,Sp) ®

490. Independent Readings in Sociology. Independent readings in various areas of sociology: (a) theory, (b) methodology, (c) demography, (d) social organization, (e) social deviance, (f) social psychology, (g) human ecology. Instructor's permission required. (1-5F,W,Sp,Su) ®

497H. Senior Thesis. Individual research on a topic or problem in sociology. Required of all students for graduation from the Honors Program in sociology. Students must also complete HASS 480H. (1-9F,W,Sp,Su)

Graduate[2]

601. Development of Sociological Theory. (3)

602. Advanced Sociological Theory. Prerequisite: Soc 401. (3)

603. Theory Construction in Sociology. (3)

610. Advanced Methods of Social Research. (3)

615. Social Statistics II. (4W)

617. Survey Research. (3Sp)

618. Qualitative Research Methods. (3)

621. Social Demography. (3)

622. Population Theories and Policies. (3)

623. Methods of Population Analysis. (3)

624. Advanced Methods of Population Analysis. (3)

630. The Sociology of Complex Organizations. (3)

631 (f550). Comparative Sociology of Work. (3)

640. Social Problems Perspectives. (4)

641. Race and Ethnicity. (3)

642. Sociology of Gender. (3)

645. Special Topics in Social Problems. (3) ®

646 (d446). Sociology of Health. (3)

660. Theories in Human Ecology. (3)

662. Sociology of Natural Resources. (3)

****663. Social Impact Assessment.** (3)

****665 (d465). Developing Societies.** (3W)

670. Advanced Rural Sociology. (3)

671 (f571). Community Theory and Research. (3)

****673 (d473). Women in International Development.** (3)

680. Seminar in Sociology. (2-4) ®

690. Independent Readings in Sociology. (1-5) ®

697. Thesis Research. (1-10) ®

699. Continuing Graduate Advisement. (1-3) ®

***701. Critical Issues in Sociological Theory.** (3)

****702. Seminar on Theorists.** (3) ®

***710. Advanced Sociological Analysis.** (3)

****711. Contemporary Issues in Sociological Research.** (3)

****725. Advanced Demography.** (3) ®

762. Social Theories on Natural Resources and the Environment. (3)

780. Seminar in Sociology. (1-5) ®

790. Independent Study. (1-5) ®

797. Dissertation Research. (1-10) ®

799. Continuing Graduate Advisement. (1-3) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing; parenthetical numbers preceded by an *f* are the *former* course numbers.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

*Taught 1996-97.

**Taught 1997-98.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

Social Work

The Social Work Program provides a learning environment for those who seek to acquire knowledge and skill in order to bring about meaningful social change in individuals, groups, communities, and society in accordance with democratic principles of civil, social, political, and economic justice. The program is committed to the realization of the goals of the American people through recognized practice principles of the social work profession and to the resolution of contemporary human social problems such as poverty, racism, discrimination, exploitation, economic injustice, poor housing, malnutrition, alienation, and inadequate education.

Social Work at Utah State University recognizes the historic importance of social welfare in balancing the country's economic and social structure. Correspondingly, the mission of the program is to prepare social workers for practice in a diverse society that has been unable to meet the needs of a vast segment of its people and to equip students with the knowledge and skills essential to the general tasks of promoting social welfare in institutions such as education, health, employment, housing, and criminal justice.

The program's guiding educational philosophy is based on two broad traditions: the Land Grant university heritage and generalist social work practice. Thus the program is directed toward providing grounding in the fundamental generic skills, knowledge, and values of social work; is dedicated to research, extension, and service to the profession and the State of Utah; and is reflective of the fundamental need to adjust social institutions to the democratic and egalitarian ideals of both the University and the social work profession.

Program Goals

There are four fundamental **goals** that guide the Social Work Program:

1. **To prepare qualified students for employment at the beginning level of professional social work practice.** The program is based on a generalist conception of social work and a problem solving approach to practice. The social work sequence stresses problem solving at the interface of person and environment, which requires that students develop a repertoire of generalist practice skills. The program inculcates in students the knowledge, skills, understanding, and values necessary to perform multi-level assessments and interventions utilizing a theoretical knowledge base.

2. **To contribute to the profession of social work and the delivery of human services through research and service at the local, regional, and international levels.** The program encourages faculty and students to develop research and training grants, to present papers at regional, national, and international meetings, and to publish scholarly research in professional journals and extension publications. Also supported are faculty training, research, and consultation activities to improve the quality of human services in Utah, the region, and in developing countries overseas. This goal grows out of the research and extension mission of Utah State University as a major land grant institution.

3. **To provide selected liberal education coursework for the general student body.** The program is committed to disseminating through coursework the knowledge, attitudes, and values of social work to the general student body of Utah State University, which enhances their understanding and sensitivities to the complexities of social welfare.

4. **To prepare students for advanced professional and continuing education.** The program endeavors to prepare students for advanced standing in graduate professional programs and to provide a solid academic base for continuing education. To accomplish this, the program is designed to facilitate the development of a well-rounded liberal arts educational foundation, good study habits, written and verbal communication skills, and the ability to think critically.

Social Work Major

Licensure and State Merit System. The baccalaureate social work program at Utah State University is accredited by the Council on Social Work Education and meets the requirements set by the State of Utah for certification of social service workers.

Admission to the Major. New and transfer students seeking to major in social work must complete SW 105 with a grade of *C+* or higher and obtain a *P* in SW 227. Students must have a minimum overall GPA of 2.5 and a minimum 2.75 GPA in Social Work classes. Students must also complete the pre-social work course of study prior to applying for admission to the major. Applicants must submit an application form and attach a transcript. Application forms are available from the secretary, Social Work Program office.

Majors must meet the following graduation requirements:

1. Social Work majors are specifically required to take Biology LS 101, Biology and the Citizen, as part of their Life Science General Education Quadrant. They must also complete FHD 150.

2. Completion of Engl 101, and Engl 200 or 201, or equivalent.

3. Completion of 62 credits in social work and other selected areas as specified below. For purposes of admission to field practicum, an overall Social Work grade point average of 2.75 must be maintained in courses required for the major. Students must also maintain a 2.5 overall GPA.

a. Complete the **Pre-Social Work Course of Study:** SW 105, 227, 240, 250; FHD 150; Anth 101; Engl 101 or 111; Engl 201; Biol LS 101. This curriculum is designed to introduce the student to fundamental knowledge in social work. This includes field observation, minority issues, and a basic understanding of human behavior in the social environment.

b. Complete the **Social Work Major Course of Study:** SW 305; SW 335 or 375; SW 365, 410, 415, 416, 417, 535; Soc 312. The Major Course of Study builds on fundamental Social Work knowledge. It is designed to prepare the student in Social Work skills and to address issues and fields of practice.

4. Complete the **Field Practicum** requirements of a minimum of 450 clock hours of supervised field practicum. This is done through enrollment in SW 387, 388, 487, 488, 587, and 588 on a concurrent basis. All other Social Work courses, except SW 535, must be completed before application to the practicum. To be admitted, students must have completed SW 305, 415, 416, and 417 with a grade of *B-* or higher. Students are admitted to the practicum only after making application with the Practicum Director. Such application must be made during the winter quarter of the academic year prior to enrollment in the practicum.

5. During academic and field training, the student is required to abide by the Code of Ethics and standards of conduct as specified by the National Association of Social Workers and the Utah State Board of Social Work Examiners.

6. Students must complete the Liberal Arts and Sciences (LAS) Area Studies Certificate (Broadening Knowledge Option II) unless they have already accumulated 45 or more credits from another institution upon entering the program or unless they transfer from another major at USU.

7. Social Work majors may not take SW 105 and 335 by independent study.

8. Students in the Social Work major must maintain a minimum 2.75 GPA in Social Work classes.

9. Students admitted to the Social Work major must join the National Association of Social Workers and attend the association meetings.

10. All Social Work practice, skills, and practicum classes are open **only** to Social Work majors.

11. All Social Work classes must be taken in the sequence outlined on the major requirement sheet, which may be obtained from the Social Work Program office.

12. Before admission to the major, students must complete all General Education classes.

13. Failure to abide by or meet program standards may result in suspension from or probation in the major.

14. Yearly updates are made to program requirements. The latest program updates can be found on the major requirement sheets. Students entering the program are responsible for obtaining the appropriate sheet from the Social Work Program office.

Social Work Minor

The minor in Social Work at USU is designed to offer to majors in other fields a professional orientation to the knowledge base, values, and skills of the field of social work in order to complement and enhance their training in another academic major. Students electing to complete a minor in social work should contact the Social Work Program Coordinator for advising and consultation.

Social work training can augment preparation in a variety of fields. Generally those who elect a minor in social work receive their major education in the social sciences, behavioral sciences, or education. The knowledge and skills of social work are also relevant to preparation for a career in business, the medical helping professions, and other allied disciplines. The content of the social work minor is flexible and can be adapted to the specific educational needs of each student.

Requirements. 1. All minors complete a minimum of 18 credits in Social Work courses.

2. Introduction to Social Welfare is required of all social work minors: SW 105 (3 credits).

3. The balance of 15 credits can be selected from the following list in consultation with the Program Coordinator: SW 227, 240, 250, 300, 335, 365, 375, 410, and 535.

Teaching Certification. The student majoring in social work who seeks certification in secondary education may take the required courses listed in the handbook for teaching majors and minors in the approved subject areas.

Social Work Courses

SS 105. Introduction to Social Welfare. Public and voluntary programs which provide social services. Prerequisite to social work core courses. (3F,W,Sp) ©

227. Field Observation. A supervised volunteer experience in a social service agency. Prerequisite: SW 105. (2Sp)

240. Social Welfare and Minority Groups. Examines social and cultural characteristics of various minority groups and emphasizes the use of social welfare resources for finding solutions to minority group problems. Prerequisite: SW 105. (3F)

250. Human Behavior in the Social Environment. Interrelatedness of social, cultural, and environmental factors that combine with biological and psychological components to mold human behavior; and their relevance to generalist social work practice. Prerequisite: SW 105. (3W)

300. Child Abuse and Neglect: A Multidisciplinary Approach. Goal is to equip students with an increased knowledge and awareness of the etiology, identification, reporting, and treatment of abused children and abusive parents. Prerequisites: SW 105, 227, 240, 250. (3W) ©

305. Social Work Practice. Introduction to social work practice; the generalist approach, helping process, values and ethics, skills and assessment. Limited to Social Work majors. Prerequisites: SW 105, 227, 240, 250. (3F)

335. Child Welfare. Developments in programs for meeting such needs of children as substitute parental care, adoptions, delinquency problems, mental retardation, and unmarried motherhood. Prerequisites: SW 105, 227, 240, 250. (3F) ©

336. Social Work With Adolescents. Theory and technique of working with delinquent and troubled youth using the social work perspective. Prerequisites: SW 105, 227, 240, 250. (3W)

365. Mental Health. Services offered for the prevention and treatment of mental illnesses and the feasibility of social action programs on a community level. Prerequisites: SW 105, 227, 240, 250. (3W)

375. Medical Social Services. Factors specific to social work practice in medical settings and with physically ill and terminal patients. Prerequisites: SW 105, 227, 240, 250. (3Sp)

387. Beginning Field Practicum. Beginning individualized internship to meet requirements of departmental students. A minimum of 150 hours of supervised field experience in a Social Service agency is required. Limited to Social Work majors. Prerequisites: instructor's permission and by application. (3F) ®

388. Practicum Integrative Seminar I. Seminar to integrate field work experiences and academic knowledge. Emphasis on ethics in social work practice and policy, the helping process, and evaluation of practice. Prerequisites: instructor's permission and concurrent enrollment with SW 387. Enrollment limited to social work majors. (2F) ®

410. Social Work Research. Survey of scientific methods of research in social work. Articulation of research with practice and policy. Prerequisites: SW 105, 227, 240, 250. (3W)

415. Social Work Skills I. Planning and intervention theories, techniques and skills within a generalist practice framework. Prerequisites: SW 105, 227, 240, 250, 305, or permission of instructor. Open only to social work majors. (3W)

416. Social Work Skills II. Intervention, termination, and evaluation skills, methods and techniques within a generalist practice framework. Prerequisites: SW 105, 227, 240, 250, 305, or permission of instructor. Open only to social work majors. (5Sp)

417. Social Work Skills III. Organizing within a generalist framework; building constituencies, mobilizing resources, brokering, advocacy, negotiating, and grassroots development. Prerequisites: SW 105, 227, 240, 250, 305, or permission of instructor. (3Sp)

485. Social Work Seminar. Current selected social work issues and procedures, such as social legislation, social service to rural areas, trends, etc. Recommended for social work majors and others interested in current social concerns. (3-6) ®

487. Intermediate Field Practicum. Intermediate individualized internship to meet requirements of departmental students. A minimum of 150 hours of supervised field experience in a social service agency. Prerequisites: instructor's permission, and SW 387 and 388. Enrollment limited to social work majors. (3W) ®

488. Practicum Integrative Seminar II. Seminar to integrate field work experiences and academic knowledge. Emphasis on intervention with individuals, groups, and communities; person and environment concept; practice with diverse populations; and evaluation of practice. Prerequisites: instructor's permission, concurrent enrollment with SW 487. Enrollment limited to Social Work majors. (2W) ®

497H. Senior Thesis. Individual research on a topic or problem in social work. Required of all students for graduation from the Honors Program in social work. Students must also complete HASS 480H. (1-9F,W,Sp,Su)

535. Public Social Policy. Examination and evaluation of various social welfare institutions and programs attacking poverty and inequality of opportunity. Prerequisites: SW 105, 227, 240, 250. (3Sp)

587. Advanced Field Practicum. Supervised agency practicum and projects for advanced students in social work. A minimum of 150 hours of field experience in a social service agency is required. Prerequisites: instructor's permission and SW 487, 488. Enrollment limited to social work majors. (3Sp) ®

588. Practicum Integrative Seminar III. Integrates field work experiences and academic knowledge. Emphasis on research in practice; public social policy; values, knowledge, and skills in social work practice; and job campaign strategies. Concurrent enrollment with SW 587 is required. Prerequisitte: instructor's permission. Enrollment limited to social work majors. (2Sp) ®

590. Topical Issue Seminar. Advanced social science seminar, designed as a forum for advanced students from varied social science disciplines. (2-6) ®

595. Directed Readings in Social Work. Instructor's permission and a plan for study required. (1-5F,W,Sp,Su) ®

Anthropology

Anthropology is the integrated study of human beings in all their aspects. It offers a broad framework for understanding human beings and society through courses dealing with the biological evolution of human beings, prehistoric culture change, and present diversity of cultures and human types.

Anthropology is distinguished in its use of both scientific and humanistic approaches to study the nature of humankind in all its complexity. Anthropologists utilize scientific techniques first developed in the natural sciences to identify discrete problems and develop testable hypotheses. At the same time, anthropologists build theory which explains the experience of being human in terms accessible to the mind. As one of the humanities, anthropology also interprets cultures in ways that make the "alien" more meaningful and understandable to members of other societies. With its emphasis on holism, the field avoids much of the particularism which renders considerable portions of science inapplicable to the ordinary experience of life.

The contemporary social science student lives in a world of diminishing cultural and national barriers. In this setting, ethnocentrism and provincialism emerge as principal impediments to human and material progress. Anthropology's tradition of cultural relativism and its focus on describing the complex unity of human behavior prepares students to adapt quickly and successfully to a wide range of jobs.

Requirements

Anthropology majors must meet the following course requirements:

1. Complete the general requirements of the University (a suggested schedule of courses to meet these requirements is available from the department secretary or from the student's adviser).

2. Complete a minimum of 45 credits within the program. This is exclusive of any department course used to fill General Education requirements. Anthropology majors must maintain a grade point average of 2.5 in courses within the program. A grade of *C* or better is required in all Anthropology courses and Statistics courses used to meet requirements for an Anthropology major or minor.

3. Complete the following required courses: Anth 101, 110, 231, 410, 499, 501.

4. Choose a minimum of 19 credit hours from remaining program course offerings. Six credits must be taken from each area: cultural anthropology, physical anthropology, and archaeology.

5. Students planning to receive a BA degree must complete two years training or equivalent in a foreign language approved by the Languages and Philosophy Department or one year or equivalent in each of two foreign languages approved by the Languages and Philosophy Department.

6. Students planning to receive a BS degree must complete Stat 201, Introduction to Statistics (4 credits), and either Soc 312, Social Statistics I (3 credits), or Stat 301 and 502, Statistical Methods (6 credits).

Anthropology Minor

Students completing a minor in anthropology must complete 20 credits of coursework, as follows:

1. Complete the following required courses: Anth 101 or 150 (5 credits) and Anth 110 or 231 (5 credits).

2. Complete at least 10 credits of additional coursework in anthropology.

Anthropology Courses

SS 101. Introduction to Anthropology. Basic areas of anthropology including human biological and cultural evolution, culture and social life, and analyses of the nature and variability of human institutions. (5) ©

SS 102. American Culture. Basic beliefs, values, customs, and institutions of America. (3)

SS 110. Human Origins. Introduction to biological anthropology including study of fossil and living primates, evolution and variability of fossil humans, contemporary human variation, processes and factors in evolution. (5)

SS 150. Peoples and Cultures of the World. Intensive comparisons of the economic, political, kinship, and religious structures of representative societies from the major culture areas of the world. (5) ©

IO 210. Perspectives on Race. Study of the processes of racial differentiation, the analysis of biological differences found among existing races, and the influence of biology and culture upon race. (3)

IO 231. Introduction to Archaeology. Survey of the interdisciplinary science of archaeology, the study of past human behavior from material remains. Major transitions in prehistory are examined. (5)

305. Anthropology and Religion. Cross-cultural description and theoretical analysis of religion and its functional relationships to human psychology, society, and the natural environment. (3)

IO 340. An Introduction to Linguistics. Theory of language and survey of structural and generative phonology, morphology, syntax; language acquisition; second language learning. (See Ling 340.) (5)

350. American Indian Cultures. Economic, political, kinship, and religious structures of representative native cultures of North America. Emphasis on the peoples of the American West. (3)

351. Traditional Africa. Geography, ethnology, and early history of Africa to the coming of the colonial powers. (3)

354. Peoples and Societies of Contemporary Sub-Saharan Africa. Peoples and social systems of contemporary sub-Saharan Africa, including review of Africa's major development problems from an anthropological perspective. (3-5)

355. Southwestern Indian Cultures. Native cultures of the Pueblo, Navajo, Apache, Utes, and other peoples of the Great Basin and Colorado River areas. Overview of the prehistory of the Greater Southwest. (3)

401. Comparative Aesthetics. Comparative and theoretical study of the role of feelings and values in human life with emphasis on the relationships between institutions in which feelings are prominent. (3)

404 (d604).[1] Peoples of Latin America. Survey of Latin American cultures, past and present, from an anthropological perspective. Emphasis on contemporary issues in Andean South America, Amazonia, and Mesoamerica. (3W)

406. The Origins of Writing and Literacy. Origins of writing including, especially, cuneiform and Mayan and Egyptian hieroglyphics. Epigraphy, or the decoding of ancient writing systems. Role of literacy in society. (3W)

407 (d607). Anthropology of Sex and Gender. A cross-cultural study of gender and sexual customs. (3)

408. Ethnographic Research Methods in Anthropology. Introduction to methods of ethnographic data collection, recording, analysis, and write-up. Emphasis on qualitative methods. (3Sp)

409 (d609). Medical Anthropology. Study of disease, medicine, and health as they relate to human biology, beliefs, and lifeway examined from prehistoric to modern times and cross-culturally. (3)

410 (d610). The Practice and Principles of Cultural Anthropology. Reviews practice and principles of cultural anthropology, introduces major paradigms, and emphasizes critical reading and thinking skills. (3F)

411 (d611). Primate Paleontology. History and evolution of the Primate Order, with particular emphasis upon the hominids (human-like forms). (3Sp)

412 (d612). Human Osteology. Study of human skeleton, including applications to fields of archaeology, paleopathology, and forensic science. (4W)

425. Work Co-op. Cooperative education work experience in anthropology. Instructor's permission required. (1-15F,W,Sp) ®

430 (d630). North American Prehistory. Archaeology of Native Americans from initial occupation of North America to historic contact. Scientific nature and ecological approach of contemporary archaeology is emphasized. (3)

433 (d633). Archaeology Field School. Three- to eight-week internship on an archaeological field project including survey, excavation, recording, mapping, and scientific conduct of archaeological problem solving. Instructor's permission required. (4-10) ®

434. Anthropology Laboratory Techniques. Laboratory experience enabling participation in analysis/reporting stages of archaeological or physical anthropology project. Includes discussions, laboratory work, and student project. Instructor's permission required. (1-3) ®

436 (d636). Great Basin Archaeology and Past Environments. Prehistoric to historic human ecology and paleoenvironments of the Desert West. Three credits lecture, five credits lecture/two weekend field trips. (3-5Sp)

441 (d641). Shamanism and Traditional Medicine. Survey of traditional forms of [illegible] in anthropological context. Emphasis on discussion and application of readings to ethical and practical concerns. (3W)

452 (d652). Applied Anthropology and Culture Change. Nature and problems of planned interventions in Third World societies undergoing technical, economic, and social change. (3)

453 (d653). Cities and Development in the Third World. Review of anthropological studies of Third World urbanization and its role in national development. (3-4)

459. Folklore of Utah. Study of the lore of major Utah folk groups (ethnic and immigrant, occupational, religious, and regional). (3)

461 (d661). Psychological Anthropology. Comparative analysis of psychiatric disorders and behavior disturbances in various societies of the world; special consideration given to contemporary Western diagnostic concepts and therapeutic practices. (3)

480 (d680). Seminar: Topics in Anthropology. Seminar in various special topics in anthropology. Topics will vary from quarter to quarter. (3-5) ®

497H. Senior Thesis. Individual research on a topic or problem in anthropology. Required of all students for graduation from the Honors Program in anthropology. Students must also complete HASS 480H. (1-9)

499 (d699). Anthropological Theory. The intellectual history of alternative theoretical perspectives in anthropology. Analysis of contemporary dilemmas, issues, and applications. Course is seminar format and team taught. (4W)

501. Senior Seminar. A seminar emphasizing research and writing skills in selected topics in anthropology. (3Sp) ®

505. Third World Economic Systems. Anthropological analysis of economic institutions and development in non-Western societies. (3)

524 (d624). Regional Folklore. Regional folklore of a specific region, identified each quarter taught. (3) ®

IO 526. Legends, Myths, and Folktales. Substance and significance of folk prose narratives both in the past and in contemporary society. (3)

590. Independent Studies. Specialized training for advanced students based on a proposal approved by instructor. (1-5) ®

Graduate[2]

604 (d404). Peoples of Latin America. (3W)

607 (d407). Anthropology of Sex and Gender. (3)

609 (d409). Medical Anthropology. (3)

610 (d410). The Practice and Principles of Cultural Anthropology. (3F)

611 (d411). Primate Paleontology. (3Sp)

612 (d412). Human Osteology. (4W)

622. Folk Narrative. (3) ®

624 (d524). Regional Folklore. (3) ®

630 (d430). North American Prehistory. (3)

633 (d433). Archaeology Field School. (4-10) ®

636 (d436). Great Basin Archaeology and Past Environments. (3-5Sp)

641 (d441). Shamanism and Traditional Medicine. (3W)

652 (d452). Applied Anthropology and Culture Change. (3)

653 (d453). Cities and Development in the Third World. (3-4)

657. American Studies Internship in Mountain West Culture. (2-13) ®

661 (d461). Psychological Anthropology. (3)

669. Themes in Folklore. (3)

673. Studies in Folklife. (3) ®

680 (d480). Seminar: Topics in Anthropology. (3-5) ®

690. Independent Studies. (1-5) ®

699 (d499). Anthropological Theory. (4W)

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuing Education Independent Study Division.

*Taught 1996-97.

**Taught 1997-98.

Department of
Special Education and Rehabilitation
College of Education

Head: Professor Charles L. Salzberg
Office in Emma Eccles Jones Education 313A, 797-3243

Professors Martin Agran, Garth M. Eldredge, Marvin G. Fifield, Alan M. Hofmeister, Sarah Rule, Richard P. West, Karl R. White, K. Richard Young; **Professor Emeritus** Glenn I. Latham; **Associate Professors** Pamela J. Hudson, Benjamin Lignugaris/Kraft, Daniel P. Morgan; **Associate Professors Emeritus** Hyrum S. Henderson, Devoe C. Rickert; **Assistant Professors** Betty A. Hallenbeck, Timothy A. Slocum, Julie F. Smart; **Extension Assistant Professor** Jane B. Pemberton; **Research Assistant Professor** Robert L. Morgan; **Clinical Instructors** Marlene Deer, Barbara J. Fiechtl, Joan F. Forsgren-White, Cynthia J. Rowland, Kimberly H. Snow; **Professional Adviser** Darcie L. Peterson

Degrees offered: Bachelor of Science (BS), Master of Science (MS), Master of Education (MEd), Doctor of Philosophy (PhD), Educational Specialist (EdS) in Special Education; the Special Education and Rehabilitation Department participates in the Interdepartmental Doctor of Education (EdD)

Areas of Specialization: The Department of Special Education and Rehabilitation offers training programs for individuals who want to work with children and adults with disabilities. A student fulfilling the undergraduate course requirements will qualify for a BS degree in special education and be eligible for an endorsement to teach students with mild/moderate disabilities, students with severe disabilities, or young children with disabilities. The severe and mild/moderate endorsements allow graduates to teach pupils with disabilites from kindergarten through 12th grade. In addition, the department offers dual teaching majors with the Departments of Secondary Education and Elementary Education. Students completing the dual major requirements in secondary education will be eligible for teacher certification in one of the special education endorsement areas and their secondary education content major. Students completing the dual major requirements in elementary education will be eligible for teacher certification in one of the special education endorsement areas and elementary education. Students interested in teaching preschool children with disabilities may receive an early childhood special education certificate for ages 0-5, in addition to a K-12 special education endorsement or an early childhood endorsement.

Objectives

The Department of Special Education and Rehabilitation offers educational and training opportunities for teachers, supervisors, support personnel, rehabilitation counselors, and others working with exceptional children and adults with disabilities. The undergraduate program prepares students to work with individuals with mild, moderate, and severe disabilities and with early childhood special education. The master's programs emphasize the preparation of master teachers and rehabilitation counselors. Students who are majoring in other teaching fields (i.e., elementary education, secondary education) are encouraged to pursue a second endorsement by taking those courses which lead to a special education credential. The doctoral program emphasizes national leadership in special education through empirical research, scholarship, and development of innovative approaches to service and personnel training on behalf of individuals with disabilities.

Requirements

Departmental Admission Requirements. Admission requirements for the Department of Special Education and Rehabilitation are in compliance with the College of Education admission to Teacher Education requirements. A 2.75 GPA is required for admission.

Admission to Endorsement Courses in Special Education. Students should apply for admission to endorsement courses during the spring quarter prior to the academic year in which they will begin their endorsement courses. Admission to these classes will be competitive based on several factors. These include: the student's current GPA; the number of credit hours completed by the end of spring quarter; completion of premajor classes, such as Math 101 and SpEd 301; completion of one or more professional education classes; and the student's career goals and experiences.

Bachelor of Science in Special Education. Undergraduate study leads to the Bachelor of Science degree in Special Education with certification to teach students with mild/moderate disabilities, severe disabilities, or early childhood special education.

I. General Education

A. Written Communication (12 credits)

B. Learning Skills (10 credits)

C. Broadening Knowledge (30 credits)

II. Professional Education (18-21 credits)

III. Special Education Major (63-73 credits). Coursework includes human growth and development, applied behavior analysis, introduction to systematic instruction (task analysis, curriculum-based measurement, behavioral objectives, contingent reinforcement), designing curriculum, Individualized Educational Programs (IEP); educational assessment, analysis and adaptation of instructional materials, intervention strategies for academic and social behaviors, and parent involvement.

Additionally, each block of courses includes practicum work with exceptional children or youth. The final practicum involves student teaching in special education or mainstreamed settings.

IV. Emphasis Area (24 credits). The emphasis area is designed to enhance the Special Education major's background. Areas recommended include communicative disorders, psychology, sociology, family and human development, recreation, and physical education.

V. Electives (16-29 credits)

VI. Total credits (186)

Graduate Study

See the *Graduate Catalog* for further information concerning certification, Master of Science, Master of Education, Supervisory Credential, and Doctor of Philosophy programs in special education.

Special Education and Rehabilitation Courses

215. Introductory Experience with Students with Disabilities. In this introductory seminar and practicum, students learn basic instruction techniques from videodisc simulations and apply them in public schools. (4W,Sp) ®

301. Education of Exceptional Individuals. Characteristics of all types of exceptional children with emphasis on the educational and psychological implications of these conditions to the development of the child. (3F,W,Sp,Su) ©

491. Undergraduate Research and Creative Opportunities. Individually directed study at the undergraduate level. Permission of instructor required. (1-3F,W,Sp,Su) ®

497H. Honors Thesis. Provides an opportunity for honors students in the Department of Special Education and Rehabilitation to interact with other honors students in the College of Education and explore an interdisciplinary area of interest. A written paper will be required. (1-6) ®

501. Behavioral Assessment and Data-based Decision Making. Methods of collecting performance data, using data to make decisions regarding student progress, teacher accountability, and methods of graphing and analyzing data. Prerequisite: admission to special education major or permission of instructor. (3F)

502. Assessment of Persons with Disabilities. Students will learn to assess persons referred for special education services to determine eligibility and to assess their progress in special education. Prerequisite: admission to special education major or permission of instructor. (2F)

503. Introduction to Transition and Vocational Education. Introduction to transition programming and vocational training for students with disabilities (mild-severe), including daily living, community survival, and career education issues. Prerequisite: admission to special education major or permission of instructor. (2F)

504. Foundations of Effective Instructional Procedures. Provides prospective special education teachers with effective instructional approaches to help students achieve mastery and proficiency in learning. Prerequisite: admission to special education major or permission of instructor. (3F)

505. Applied Behavior Analysis in Education. Students will learn to effectively apply principles of behavior management and instruction of children and youth. Prerequisite: admission to special education major or permission of instructor. (3W)

506. Consulting with Parents and Teachers. Provides strategies for communicating with parents and teachers, as members of a multidisciplinary team, to assist parents in advocacy and other teachers in collaborative problem solving. Prerequisite: admission to special education major or permission of instructor. (4Sp)

507. Policies and Procedures in Special Education. Provides an understanding of federal and state laws for persons with disabilities and procedures for organizing a special education classroom and auxiliary staff. Prerequisite: admission to special education major or permission of instructor. (3W)

508. Remediating Behavior Problems and Social Skills Deficits. Helps develop skills for remediating behavior problems and teaching social skills in elementary/secondary settings; emphasizes protecting rights of persons exhibiting behavior problems. Prerequisite: admission to special education major or permission of instructor. (3Sp)

520. Student Teaching in Special Education. Prerequisite: admission to special education major or permission of instructor. (3-15F,W,Sp,Su)

521. Student Teaching in Special Education: Dual Majors. Undergraduate student teaching for dual majors. (3-15F,W,Sp)

532. Curriculum for Students with Mild/Moderate Disabilities. Future teachers learn to analyze transition, school survival skills, and content area curricula, and develop skills to teach in these areas. Prerequisite: admission to special education major or permission of instructor. (4W)

533. Teaching Secondary Students with Mild/Moderate Disabilities. Provides prospective resource teachers with methods and techniques appropriate for teaching students with mild and moderate disabilities in secondary special education programs. Prerequisite: admission to special education major or permission of instructor. (3)

540. Practicum: Direct Instruction Reading and Language. Students teach academic skills to pupils with mild or moderate disabilities daily using direct instruction techniques. Prerequisite: admission to special education major or permission of instructor. (1-5F,W)

541. Practicum: Instruction in Mathematics. Students will learn to teach students with mild/moderate disabilities in mathematics so that each progresses as fast as his/her capabilities allow. Prerequisite: admission to special education major or permission of instructor. (1-5F,W)

542. Practicum: Eligibility Assessment. Students will learn to conduct assessments of school-aged pupils suspected of having mild or moderate disabilities according to state guidelines. Prerequisite: admission to special education major or permission of instructor. (2Sp)

543. Practicum: Teacher Designed Instruction. Students assess, design teaching materials, and provide daily instruction to pupils with mild or moderate disabilities. Prerequisites: SpEd 540 and 541 and admission to special education major or permission of instructor. (1-4W,Sp) ®

551. Curriculum for Students with Severe Disabilities. Provides students with information about commercially available curricular materials, as well as the skills necessary to plan for and design curricula for persons with severe disabilities. Prerequisite: admission to special education major or permission of instructor. (3W)

554. Curriculum for Secondary Level Students with Severe Disabilities. Students will learn to evaluate, administer, and interpret various assessment instruments and design and implement vocational and community living skills programs. Prerequisite: admission to special education major or permission of instructor. (3Sp)

556. Practicum in Improving School System Programs. Seminar focused upon a different phase of the instruction program; a sequence of developmental training programs; and new and persisting problems in many dimensions of teaching. Permission of instructor required. (1-6) ®

557. Assistive and Adaptive Technology for Persons with Disabilities. Trains students to assess needs for augmentative/alternative communication devices; and select, program for, maintain, repair, and build adaptive devices. Prerequisite: admission to special education major or permission of instructor. (3W)

558. Issues in Educating Persons with Severe Disabilities. A seminar to discuss current topics and research trends affecting persons with severe disabilities. Prerequisite: admission to special education major or permission of instructor. (1Sp) ®

561. Practicum: Introduction to Instruction of Students with Severe Disabilities. A field-based class providing experience in observing and teaching students with severe disabilities. Prerequisite: admission to special education major or permission of instructor. (1-4F,W)

562. Practicum: Systematic Instruction of Students with Severe Disabilities. Students will administer functional assessments and design instructional programs. Prerequisite: admission to special education major or permission of instructor. (1-4F,W,Sp)

563. Practicum: Advanced Systematic Instruction of Students with Severe Disabilities. Students will assess, design instructional programs, and develop classroom management skills. Prerequisite: admission to special educaton major or permission of instructor. (1-4F,W,Sp)

574 (d626).[1] Methods and Materials for Educating the Preschool Child with Disabilities. Provides students with a knowledge of curricula and instructional strategies for teaching preschool children with disabilities. Prerequisite: admission to special education major or permission of instructor. (3Sp)

576. Teaching Infants and Young Children with Disabilities. Provides information on interventions for children aged 0-5 with disabilities, including skill areas, environmental organizations, and the family's role in developing individual family service plans and interventions. Prerequisite: admission to special educaion major or permission of instructor. (3F)

578. Teaching the Young Child with Disabilities in the Least Restrictive Environment. Presents techniques for working with multidisciplinary staff teams and techniques of serving preschoolers with disabilities in an array of program environments. Prerequisite: admission to special education major or permission of instructor. (4W)

579. Special Topics. (1-4F,W,Sp,Su) ®

581 (d661). Vocational Assessment for Persons with Disabilities. Addresses vocational assessment for persons with disabilities. Includes an overview of traditional vocational assessment, but will focus on contemporary methodology developed for individuals with severe disabilities. (3Sp)

582. Teaching Vocational Skills to Persons with Disabilities. Prepares students to develop and implement programs that teach vocational skills to persons with disabilities. Curriculum will include interpersonal work skills, production-related skills, and job responsibility. (3)

584. Practicum in the Least Restrictive Environment with Family Service Plans. Students will participate in a variety of environments serving preschoolers with disabilities, assist in developing a Family Service Plan, and train another adult to conduct programs. Prerequisite: admission to special education major or permission of instructor. (1-4W) ®

585 (d685). Vocational Evaluation Principles and Systems. Introduction to vocational evaluation principles and their application in using commercially available vocational evaluation systems. Actual practice with the systems (including integrated report writing) in the rehabilitation services clinic. (3Su)

586. Practicum with Infants and Families. Discussion of topics relating to service delivery for infants and their families. Experience in serving families in the home. Also includes issues relating to infant health, safety, and development. Prerequisite: admission to special education major or permission of instructor. (4F)

590. Independent Study. Permission of instructor required. (1-3F,W,Sp,Su) ®

591. Independent Research. Permission of instructor required. (1-3F,W,Sp,Su) ®

Graduate[2]

601. Counseling Parents of Exceptional Children. (3)

602. Design and Evaluation of Effective Instruction. (3W,Su)

603. Clinical Practicum: Student Teaching. (3-12F,W,Sp,Su) ®

604. Functional and Augmentative Communication Approaches and Technology. (5F)

605. Issues with the Delivery of Services for Students with Dual Sensory Impairments. (3F)

606. Legal Aspects of Special Education. (3)

607. Infusing Mobility and Communication for Students with Dual Sensory Impairments. (3Sp)

608. Collaboration and Management of Services for Students with Dual Sensory Impairments. (3Sp)

609. Curriculum and Environmental Variations and Management (3)

610. Introduction Rehabilitation Counseling. (3F)

611. Psychosocial Aspects of Disability. (3F)

612. Medical Aspects of Disability, Part A. (3F)

613. Vocational Counseling. (3W)

615. Case Studies in Rehabilitation. (3Sp)

616. Medical Aspects of Disability, Part B. (3W)

617. Rehabilitation Counseling Skill Development. (3F,Su)

618. Rehabilitation Practicum. (3-6F,W,Sp,Su) ®

619. Rehabilitation Internship. (6-12F,W,Sp,Su) ®

621. Assessment of Complex Learning Behavior Disorders. (3)

622. Education of Emotionally Disturbed Children. (3)

623. Teaching Secondary-aged Students with Behavioral Disorders. (3)

626 (d574). Methods and Materials for Educating the Preschool Child with Disabilities. (3Sp)

627. Cultural Issues in Rehabilitation. (3Sp)

629. Teaching Social Skills to Students with Disabilities. (3)

630. Collaboration Skills for Classroom Teachers. (3)

631. Rehabilitation of Persons with Chronic Mental Illness. (3W)

632. Seminars in Learning Characteristics of Students with Dual Sensory Impairment. (3Su) ®

633. Supervision and Administration Internship. (3F,W,Sp,Su) ®

634. Teaching Secondary Students: Content Acquisition. (3W,Su)

635. Practicum: Content Acquisition. (1-3W)

638. Theory, Practices, and Research in Learning Disabilities. (3)

641. DSI Field Studies I: Analysis of Service for Students with Dual Sensory Impairments. (3F)

642. Field Studies II: Analysis of Service for Students with Dual Sensory Impairments. (3)

643. Field Studies III: Analysis of Service for Students with Dual Sensory Impairments. (3)

644. Field-based Application Instruction. Permission of instructor required. (1F,Sp) ®

645. Field-based Applications: Collaboration. (1-3) ®

646. Field-based Applications: Research Into Practice. Permission of instructor required. (1-3) ®

650. Interdisciplinary Workshop. (1-3) ®

655. Practicum in the Evaluation of Instruction. (1-6) ®

656. Practicum in the Improvement of Instruction. (1-6) ®

659. Learning Strategies Practicum. (2Sp)

661 (d581). Vocational Assessment for Persons with Disabilities. (3Sp)

663. Job Procurement, Analysis, and Placement for Persons with Disabilities. (3W)

670. Research Into Practice. (3)

681. Seminar in Special Education. (1-3) ®

682. Rehab Professional Seminar. (1-3Su) ®

685 (d585). Vocational Evaluation Principles and Systems. (3Su)

690. Independent Study. Permission of instructor required. (1-3) ®

691. Independent Research. Permission of instructor required. (1-3) ®

693. Internship in Special Education. Permission of instructor required. (3-15) ®

696. Creative Project. (1-6F,W,Sp,Su) ®

697. Thesis. (1-9) ®

699. Continuing Graduate Advisement. (1-12) ®

705. Internship in Program Evaluation. Permission of instructor required. (1-6) ®

706. Internship in Research. Permission of instructor required. (1-6) ®

733. Supervision Internship. Permission of instructor required. (3-12) ®

750. Interdisciplinary Workshop. (1-3) ®

755. Evaluation of Supervisory Performance. (1-6) ®

780. Issues in Special Education. (1-6) ®

781. Research Seminar in Special Education. (1-6) ®

783. Special Education Personnel Preparation. (3F)

790. Independent Study. Permission of instructor required. (1-3) ®

791. Independent Research. Permission of instructor required. (1-3) ®

793. Internship in Special Education. Permission of instructor required. (1-15) ®

797. Dissertation. (1-15) ®

799. Continuing Graduate Advisement. (1-12) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on numbe of credits that can be counted for graduation.

© This course is also offered by correspondence through the Continuin Education Independent Study Division.

Department of
Theatre Arts

College of Humanities, Arts and Social Sciences

Head: Professor Sid G. Perkes
Office in Chase Fine Arts Center 234, 797-3046

Professor Colin B. Johnson; **Professor Emeritus** W. Vosco Call; **Associate Professors** Nancy E. Hills, Lynda Linford, Arthur Y. Smith; **Assistant Professors** Kevin Doyle, Bruce L. Duerden, Dennis Hassan, Roger Held, David E. Sidwell; **Lecturer** Maggi Moar

Degrees offered: Bachelor of Arts (BA), Bachelor of Fine Arts (BFA), Master of Arts (MA), and Master of Fine Arts (MFA) in Theatre Arts

Objectives

The primary responsibilities of the Theatre Arts Department are (1) to teach appreciation, service, foundational, and specialized courses, (2) to assist in training students for careers as theatre teachers in secondary schools, (3) to prepare students for advanced study and training, and (4) to sponsor worthwhile production programs in which students can practice the art and craft of theatre, interpretation, and narrative theatre, and which will be dynamic contributions to the cultural life of the University community.

Production Groups and Theatres. Production groups sponsored by the Theatre Arts Department are Utah State Theatre, Studio Stage, Utah State Children's Theatre, Narrative Theatre, and the Old Lyric Repertory Company. Facilities used for performances by these groups are a thrust stage theatre in the Chase Fine Arts Center; the Lyric, a small proscenium theatre in downtown Logan; and the Studio Theatre. Information concerning the production groups and theatres is available in the Theatre Arts Department office, Fine Arts 234.

Requirements

Departmental Admission Requirements. Admission requirements for the Department of Theatre Arts are the same as those described for the University on pages 8-11. Students in good standing may apply for admission to the department. Students transferring from other institutions need a minimum 2.5 transfer GPA.

Undergraduate Requirements. Students must accumulate 40 credit hours of approved General Education courses plus 6 credits of Written Communication.

Core Courses. All Theatre Arts Majors, except for the BFA Theatre Arts Teaching Major, are required to complete the following core courses: Thea 100, 105, 109, 121, 150, 205, 246, and 430 or 432. Students must also complete the Production Practicum (Thea 292 and 592, 10 credits).

Bachelor of Arts Degree

General Theatre Studies (89 credits): core (26 credits); performance courses (16 credits); design/technical courses (10 credits); dramatic literature-history (24 credits); production practicum (10 credits); senior project (3 credits).

Theatre Arts Teaching Minor (28 credits): Thea 100, 105, 121, 140, 150, 205, 246, and 3 credits of production practicum (292 or 592) (25 credits); elective theatre arts courses (3 credits).

To obtain the Bachelor of Arts degree, a student must fulfill the foreign language requirement.

Bachelor of Fine Arts Degree

This degree is specifically designed for those students with a firm idea of their professional goals. It is a concentrated four-year program which requires students to demonstrate acquired abilities in their emphasis area. A 2.50 GPA in Theatre Arts courses is required for graduation.

Theatre Arts Teaching Major—Theatre Arts Emphasis (45 credits): Thea 100 (1 credit); production practicum (10 credits); performance courses (6 credits); design-technical courses (6 credits); dramatic literature (7 credits); oral interpretation (15 credits). Candidates must also complete the teaching certification requirements.

Acting/Directing (Performance) Emphasis

Theatre Design and Technology Emphasis

Candidates are accepted into the performance program through audition and interview and into the design-tech program through interview and submission of a portfolio. A departmental BFA committee presides over the acceptance process and progress reviews. Transfer students are subject to the same acceptance process and progress review. Inquiries about specific requirements and expectations should be directed to the Theatre Arts office.

Students seeking the BFA degree should work closely with advisers. General Education requirements, core courses, production practicum, and some area emphasis courses should be completed before the end of the sophomore year. Individual needs, interests, and goals of the student will be used in elective course selection. The department maintains an updated Course of Study to aid the student in selecting courses for the first two years of the curriculum in recommended sequence. Inquire at the Theatre Arts Department office, FA 232.

Production Responsibilities

All majors and teaching minors are required to participate in the various production programs of the department. A theatre participation record is maintained for each student, and successful completion of crew and performance assignments is a requirement for graduation.

Majors who wish to qualify for a secondary teaching certificate must apply for admission to teacher education.

During the senior year all theatre arts majors are required to complete a project in a phase of theatre in which they are interested. (Inquire at department office, FA 232, for further information.)

Graduate Study

For information about the graduate study program and requirements for the MA and MFA in theatre arts and theatre arts with special emphasis, see the *Graduate Catalog*.

Theatre Arts Courses

100. Theatre Orientation for Majors. An orientation course for theatre arts majors/minors in departmental philosophy, policies, procedures, and requirements. Required of all majors/minors. (1F,W,Sp)

HU 101. Understanding Theatre. Survey of dramatic principles and theatrical conventions. The function of theatre personnel and practices of the contemporary stage. (5)

105. Introduction to Theatre Studies I: Script Analysis. Textual study of scripts from contemporary and historical drama, readers theatre, film, TV, and radio for analysis of plot, character, language, ideas, and staging. (3W)

107. Stage Movement. Develops self-awareness through self-discipline. Class emphasis: tension/relaxation, postural correction, balance, strength, flexibility, breath control, spacial exploration, and developing awareness of habitual movement patterns. (1F)

109. First Year Voice for Theatre. Introduction to the fundamental techniques of vocal production for the theatre. Emphasizes an individual program of personal vocal development. Can be repeated for up to 3 credits with permission of instructor. (1F,W,Sp) ®

121. Fundamentals of Acting. Development of the actor's physical, mental, and emotional resources. Can be repeated with permission of instructor. (2F,W,Sp) ®

HU 140. Exploring Performance Through Literature. Introduces students to fundamental concepts and practices of oral language arts. Integrates listening, speaking, and reading by emphasizing oral communication of major literary genres. (5F,W,Sp,Su)

150. Technical Workshop. Taught as a three-quarter series. One quarter is drafting and scene painting. Second is stagecraft, lighting, and sound. Third is costume construction, figure drawing, and rendering techniques. Emphasis is on terminology and techniques applicable to the theatre. Can be repeated for up to 6 credits with permission of instructor. (2F,W,Sp) ®

152. Makeup. Practice in makeup for the stage. Recommended to performers and directors of educational, church, and community theatres. (2)

154. Children's Theatre. Theory and practice in the selection, preparation, and presentation of plays for children. Recommended for prospective elementary school teachers. (3)

172. Mime and Movement for Theatre I. Practice in movement fundamentals for realistic theatre mimes. For teachers and actors. (1)

HU 201. Understanding Movies. Development of a "film sense" through appreciation of the language, content, and social utility of significant motion pictures. (3F,W)

205. Introduction to Theatre Studies II: Forms and Modes. Study of the universal characteristics of theatre apart from chronology through a categorical survey of tragedy, comedy, melodrama, and farce in both classical and romantic modes of understanding. Prerequisite: Thea 105. (3Sp)

209. Second Year Voice for Theatre. Intermediate voice for theatre. Emphasizes techniques for characterization, special problems for stylized voice, and work in verse drama. Can be repeated once for credit with permission of instructor. Prerequisite: Thea 109. (2F,W)

221. Intermediate Acting. A skills acquiring course based on organic acting techniques. Can be repeated for 4 credits with permission of instructor. Prerequisite: Thea 121. (2F,W) ®

246. Fundamentals of Directing. Study and use of composition, picturization, movement, rhythm, gesture, etc. (3W)

251. Historic Costume for the Stage I. Historical survey of the development of costumes from Egyptian to A.D. 1700 with emphasis on reproduction for the stage. Survey of manners and movement in period costume. Prerequisite: Thea 150. (3F)

252. Historic Costume for the Stage II. Continuation of Thea 251. Historical survey of costumes from 1700 to present with emphasis on reproduction for the stage. Survey of manners and movement in costumes. Prerequisite: Thea 150. (3W)

254. Stage Lighting. Lighting design, instrument placement, and control board operation. Prerequisite: Thea 150. (3F)

272. Mime and Movement for Theatre II. Advanced theory and practice in stylized mime for the theatre. Emphasis on creative approach for projecting character, emotion, and mood. Prerequisite: Thea 172. (1Sp)

292. Production Practicum. Specialized work in technical practice in ongoing Theatre Arts Department productions. Prerequisite: permission of instructor. (1F,W,Sp) ®

294. Performance Practicum. Specialized work in performance in ongoing Theatre Arts Department productions. (1-3F,W,Sp,Su) ®

303. Introduction to Playwriting. Practice in writing plays. Prerequisite: Engl 302 or equivalent. (3)

316. Dialects for Performance. Phonetic study of the major European accents and English dialects. Includes oral practice of relevant literature. Prerequisite: Thea 209. (3)

350. Scenery Painting for the Theatre. Advanced work in theory, techniques, and practice in scenery painting for the theatre. Prerequisite: Thea 150. (3W)

****372. Dance for Theatre.** Body movement designed for the needs of the actor. Emphasis on the requirements of period drama and musical comedy. (1)

****374. Choreography for the Stage.** Study and use of dance forms for the theatre: space relationships and movements for ceremonials, musicals, and stylized stage fighting. (2)

400. Company Workshop. Supervised rehearsals, technical preparation, and public performances. Prerequisite: permission of instructors. (3) ®

410. Interpretation Programming and Performance. Script analysis, cutting, compiling, mounting of solo and group programs for various audiences, educational settings, and community groups. (3F,W,Sp) ®

***430. History of the Theatre I: Origins to 17th Century.** Surveys development of theatre from ritual origins through the Spanish Golden Age by examining its architecture, staging practices, performers, management systems, and playwrights. (3F)

****432. History of the Theatre II: 17th Century to WW II.** Continuation of the preceding course from the Spanish golden age to the beginnings of mid-19th Century modernism. (3W)

434. History of American Drama and Theatre. (3W)

436. Masterpieces of British Drama. Study of major works in British drama from the beginnings to 1890, including Elizabethan, Stuart, Restoration, eighteenth and nineteenth century plays. (3)

440. Performance Studies. Oral study of the various types of literature with special emphasis on the functional relationships between literary form and oral performance. (5W,Sp)

445. Student Teaching Seminar. Focuses on problems arising during student teaching. Includes plans, procedures, adaptive classroom practices, and evaluation. To be taken concurrently with ScEd 460. (3F,W,Sp)

446. Directing. Theory and practice of stage direction. Students study directing techniques and select, cast, direct, and present scenes and short plays. Prerequisite: Thea 246. (2F,Sp) ®

450. Scene Design. Development of scene design techniques through study of and practice in rendering, perspective drawing, plan drafting, sketching, and model building. Prerequisite: Thea 150. (3)

451. Stage Costume Design. Theory and practice in the design and selection of costumes for nonrealistic, historical, and modern plays. Study of the relationship of costume to character and production. Prerequisite: Thea 150. (3Sp)

458. Creative Dramatics. Use of improvised drama as a base for developing creative thinking in children. Relevance to teaching stressed. Recommended for elementary education majors. Includes laboratory experience with children. (3)

510 (d610).[1] Interpreters Theatre. Survey of Readers Theatre including skills and techniques in cutting, building, and mounting programs using all genres of literature for the classroom. (3F,W,Sp,Su) ®

518 (d618). Storytelling. Techniques of traditional storytelling; collecting stories appropriate for periods in the child's and young adult's development. (5F,W,Sp,Su)

519 (d619). Tales and Telling: Preserving an Oral Tradition. Workshop oriented course focusing on techniques for telling, building resources, and using storytelling in the curriculum and as a means to self-discovery and personal growth. (3F,W,Sp,Su)

****520. Voice Methods.** Advanced work in voice that continues the training of Thea 109 and 209. Also an introduction to various voice methodologies. (3Sp)

521. Advanced Acting. Analysis and creating of roles with emphasis on classic characterizations, traditional acting methods and styles. Prerequisites: Thea 221, 316, 372, or equivalencies. Repeatable for up to 8 credits. (2) ®

522 (d622). Poetry Appreciation. Oral reading principles and positive strategies for introducing poetry to young people. (3F,W,Sp,Su)

523. Teaching of Speech Communication and Theatre Arts. Development of materials and strategies for teaching secondary school speech and theatre. Team taught by Speech and Theatre Arts faculties. Prerequisite: admission to teacher education. (4F)

530 (d630). Oral Interpretation Workshop of Children's Literature. Theory and practice of oral reading principles for various forms of children's literature; emphasis on choral reading, play reading, and readers theatre. (3F,W,Sp,Su)

534. Modern Continental Drama. (3)

***536 (d636). Contemporary Theatre.** Theatre from WW II to the present day, reviewing the major movements in experimentalism in literature and production from the late 19th century. (3Sp)

539. Special Topics (Topic). Specialized pro-seminar topics in theatre history offered on occasion: the classical stage, Spanish theatre, musical theatre, variety entertainments, etc. (3F,W,Sp) ®

549. Modern American Drama. (3)

550 (d650). Period Styles, Architecture, and Decoration for the Stage. The study of theatre structural forms, period architecture, furniture, ornamentation and motifs for stage settings, and techniques and practical experience in stage prop construction. Prerequisite: Thea 150. (3W)

551 (d651). Advanced Scene Design. Advanced study in design theory and rendering techniques with emphasis on scenic design for productions in a variety of styles and physical theatre spaces. Prerequisites: Thea 150, 450, and 550. (3Sp)

552 (d652). Costume Construction Lab. Individualized practical laboratory experience in pattern drafting, cutting, fitting, construction, and decoration of costumes for theatre productions. (2F,W,Sp,Su) ®

555. Theatre Leadership and Management. Leads students through the process of founding a theatre from concept to the creation of a business plan and operations manual. (3Sp)

570 (d670). Repertory Theatre Production. Rehearsal, crew, and staff assignments. Performance of four plays in repertory. Company members selected through audition and based on ability and commitment to theatre. Enrollment limited and by permission of Theatre Arts Department staff. (3-12Su) ®

581 (d681). Dramatic Theory and Criticism. Explores the traditional works of critical theory that relate to the theatrical arts beginning with Aristotle's *Poetics*. (3W) ®

584. Modern British Drama. (3)

590. Special Projects in Theatre. Directed individual research studies or creative projects related to theatre. Prerequisite: permission of instructor. (1-6) ®

592. Production Practicum. Specialized advanced work in technical practice in ongoing Theatre Arts Department productions. Prerequisite: permission of instructor. (1-3F,W,Sp,Su) ®

594. Performance Practicum. Specialized advanced work in performance in ongoing Theatre Arts Department productions. Prerequisite: permission of instructor. (1-3F,W,Sp,Su) ®

Graduate[2]

610 (d510). Interpreters Theatre. (3F,W,Sp,Su) ®

618 (d518). Storytelling. (5F,W,Sp,Su)

619 (d519). Tales and Telling: Preserving an Oral Tradition. (3F,W,Sp,Su)

622 (d522). Poetry Appreciation. (3F,W,Sp,Su)

HASS 625. Graduate Internship/Co-op. (1-15)

630 (d530). Oral Interpretation Workshop of Children's Literature. (3F,W,Sp,Su)

***636 (d536). Contemporary Theatre.** (3Sp)

650 (d550). Period Styles, Architecture, and Decoration for the Stage. (3W)

651 (d551). Advanced Scene Design. (3Sp)

652 (d552). Costume Construction Lab. (2F,W,Sp,Su) ®

670 (d570). Repertory Theatre Production. (3-12Su) ®

680. Seminar in Drama. (1-5) ®

681 (d581). Dramatic Theory and Criticism. (3W) ®

690. Research Studies. (1-5) ®

692. Projects in Theatre. (1-9) ®

697. Thesis. (1-6) ®

699. Continuing Graduate Advisement. (1-3) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

*Taught 1996-97.

**Taught 1997-98.

Interdepartmental Program in
Watershed Science

College of Natural Resources

Director: Professor John A. Kadlec
Office in Natural Resources 355, 797-2461

Professors Allan Falconer, Charles P. Hawkins; **Affiliate Professor** David S. Bowles; **Associate Professors** Roger E. Banner, Todd A. Crowl, James P. Dobrowolski, Michael J. Jenkins, Chris Luecke, R. Douglas Ramsey, G. Allen Rasmussen, Wayne A. Wurtsbaugh; **Affiliate Associate Professors** Thomas B. Hardy, Christopher M. Neale; **Assistant Professors** Mark W. Brunson, Joanna L. Endter-Wada, Michael P. O'Neill, John C. Schmidt, Robert H. Schmidt, Helga Van Miegroet; **Research Assistant Professor** Jeffrey L. Kershner; **Affiliate Assistant Professors** Thomas E. Lachmar, David G. Tarboton

Degrees offered: Bachelor of Science (BS), Master of Science (MS), and Doctor of Philosophy (PhD) in Watershed Science

Objectives

Watershed science is the interdisciplinary study of the physical, chemical, biological, and ecological interactions within drainage basins that affect the quantity and quality of water. Watershed scientists use their skills to study and manage the quality, yield, and instream uses of water. The emphasis in Watershed Science is placed on the source areas of water supplies rather than on water in major river systems. The watershed scientist defines and manages the impacts of watershed disturbances, including those associated with logging, grazing, mining, waste disposal, and recreation. Watershed scientists must be familiar with a variety of hydrologic, geomorphic, and ecological concepts and must be capable of communicating with foresters, range managers, fishery biologists, recreation specialists, and engineers.

The Watershed Science Unit administers an interdepartmental program between the departments of Fisheries and Wildlife, Forest Resources, Geography and Earth Resources, and Rangeland Resources that addresses water resources issues within a natural resources context. Students may specialize in one of three options. In the **hydrology** option students apply concepts from the physical sciences and engineering to understand how processes such as stream flow generation, moisture storage, and erosion are affected by watershed disturbance. Those in the **management** option receive broader training in managing wildland water resources for multiple uses. The **ecology** option is designed to provide students with a broad understanding of the multiple linkages that exist between the physical and biological components of upland, riparian, and aquatic ecosystems.

Requirements

Bachelor of Science in Watershed Science

All Watershed Science majors must complete the following core courses: Biol 125, 126; Bmet 200 or 530; Chem 121, 122, 124, 141; Econ 200; Geog 360, 575; Geol 111, 548; Math 220, 221; Phyx 111, 112; Soil 358, 359; Stat 201; NR 101, 102, 201, 360, 370, 380, 390; WS 300, 420, 460; RLR/FW 386; 2 courses selected from FW 300, FR 300, RR 300, and RLR 300.

In addition to the courses listed above, students must complete courses listed for **one** of the following options:

Hydrology Option. CEE 343; Geog 416; Soil 565, 566; WS 515, 545, 549.

Management Option. FR 325, 425, 527, 555; FW 525; Geog 593; MHR 360; RLR 563; WS 545.

Ecology Option. Bmet 550; FR 325; FW/WS 560; RLR 561; Zool 580; RLR 541 or Bot 420.

Minor in Watershed Science (22-24 credits). WS 300, 420, and 549; plus three courses selected from the following: CEE 343; Geog 416; WS 460, 515, and 545.

Watershed Science Courses

300. Principles of Watershed Science. Introduction to the principles that define watershed science. Topics include consideration of hydrologic, geomorphic, and ecological properties of watersheds, especially within a management context. (3W,Sp)

301. Geography/Watershed Practices. Field study of geomorphology, hydrology, and aquatic ecosystems. Field and laboratory study of Geographical Information Systems and Global Positioning Systems. Lab fee. (2 Summer Camp)

416 (d616).[1] Hillslope Geomorphology. Focuses on movement and storage of sediment on hillslopes and in small channel systems. Develops an understanding of processes responsible for shaping hillslopes and examines effects of land management on those processes. Prerequisites: Geog 113, Geol 111, or WS 300. (4F)

420. Forest and Range Hydrology. Hydrologic principles applied to the management of wildland watersheds. Effects of wildland management activities on watershed function. Lab and field exercises in applied techniques of wildland hydrology. Prerequisite: WS 300 or consent of instructor. (5F)

460. Freshwater Ecology. Introduction to the physical, chemical, and biological factors operative in fresh water habitats. A generalized discussion of aquatic habitats as nonisolated ecosystems. Prerequisites: Chem 121, 122; Phyx 120. (5W)

475. Wildland Water Quality. Water quality parameters and use criteria; "background" quality, sources of pollution, and effects of land management on wildland water quality; sampling techniques. (3Sp)

480. Undergraduate Research. Individual or team research. Prerequisite: adviser approval. (1-5F,W,Sp,Su) ®

515. Fluvial Geomorphology. Broadly examines the movement of water and sediment through stream channels, the erosional and depositional processes associated with this movement, and landforms produced by these processes. Prerequisite: Students must have completed one of the following courses: WS 300, CEE 343, Geog 113, or Geol 111; introductory calculus and physics; or must have obtained permission of the instructor. (4Sp)

***545. Disturbed Land Hydrology.** Study of hydrologic concerns associated with drastic land disturbance. Implications of wildland rehabilitation and mined land reclamation treatments to water quantity, quality, and timing will be emphasized. Prerequisite: WS 420 or equivalent. (3Sp)

546. Avalanche and Snow Dynamics. Fundamentals of snow dynamics and avalanche forecasting, management of snow in recreational areas. (1-3W)

549 (f649). Small Watershed Hydrology. A detailed exploration of the concepts of small watershed hydrology. Course material will concentrate on recent research findings for examining key hydrological processes. Also listed as CEE 549. (3Sp)

556. Snow Hydrology. Provides students with a detailed understanding of the physics and hydrology of seasonal snowpacks and their influence on the hydrology of small to mesoscale catchments. (3Sp)

560. Aquatic Ecology Laboratory. Field, laboratory, and data analysis approaches for measuring physical, chemical, and biological parameters in lakes and streams. Required field trip. Prerequisites: FW 460, Stat 201 and NR 201, or BIS 140. (4Sp)

Graduate[2]

616 (d416). Hillslope Geomorphology. (4F)

661. Stream Ecology. Prerequisite: introductory courses in general ecology or permission of instructor. (3F)

****672. Forest Biogeochemistry.** (3Sp)

682. Watershed Science Seminar. (1) ®

690. Watershed Science Problems. (1-6) ®

697. Watershed Science Thesis. (1-15) ®

699. Continuing Graduate Advisement. (1-3) ®

797. Watershed Science Dissertation. (1-15) ®

799. Continuing Graduate Advisement. (1-3) ®

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[1]Parenthetical numbers preceded by *d* indicate a *dual* listing; parenthetical numbers preceded by an *f* are the *former* course numbers.

[2]Descriptions for courses in the 600 and 700 series can be found in the *Graduate Catalog*.

*Taught 1996-97.

**Taught 1997-98.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Cooperative

Nursing Program

College of Science

Weber State University/Utah State University

Coordinator: Assistant Professor Pamela E. Hugie
Office in Lundberg Building 201, 797-1515

Assistant Professors Joanne Duke, Joyce Murray; **Instructors** Marsha A. Castleton, Christine Espy, Pat Johnson

Objectives

Weber State University and Utah State University jointly offer an Associate Degree Program in Nursing at Logan.

All nursing theory, General Education, and laboratory practice classes are offered on the Utah State University campus and in health service agencies within Weber, Box Elder, and Cache Counties.

Weber State University admits the prospective student and grants the Associate of Science degree upon the student's completion of the course. Registration takes place at the Utah State University Nursing office unless there are unusual circumstances. The student participates in pinning ceremonies held on the Utah State University Campus and graduation ceremonies held on the Weber State University campus.

Departmental Admission Requirements

Students apply for admission to the Cooperative Nursing Program by contacting the coordinator of the program, Lundberg Building, Room 201, Utah State University, Logan, Utah 84322-2600.

The student's application is handled through the Office of Nursing Admissions, Weber State University, Ogden, Utah 84408. Applicants have until February 14 to complete their application process. All application forms must be completed and sent to the Nursing Program admissions secretary at Weber State University. Notifications of status are sent to applicants around May 1.

A graduate of this program is eligible to write the State Board licensing examination to become a registered nurse. The program is accredited by the Utah State Board of Nursing and the National League for Nursing.

Students admitted to the program have the prerogative of taking the licensing examination for Practical Nursing upon an equivalency basis with the completion of the first year's course of studies.

Requirements

The curriculum listed below is planned over a seven-quarter period, using two academic years plus one summer quarter. It is planned to include a broad General Education program concurrently with courses in Nursing.

Nursing Courses

103. Nursing Fundamentals. Assists students in developing fundamental skills and identifying simple nursing problems related to basic needs of people (5F)

104. Lifespan Nursing I. Optimizing health through promotion of health and prevention of illness. (7W)

105. Lifespan Nursing II. Optimizing health through intervention, restoration, and rehabilitation. (7Sp)

108. Treatment Modalities I. Companion course to Nursing 104. Includes basic pharmacology and therapeutic treatment modalities used by nurses to promote health. (2W)

109. Treatment Modalities II. Companion course to Nursing 105. Includes pharmacology and therapeutic treatment modalities used by nurses to promote health. (2Sp)

204. Lifespan III. Health promotion, prevention, and early intervention for complex health concerns. (8F)

205. Lifespan IV. Intervention, restoration, and rehabilitation for complex health concerns. (8W)

208. Treatment Modalities III. Companion course to Nursing 204. Includes pharamacology and therapeutic treatment modalities used to promote health in clients with complex health concerns. (2F)

209. Treatment Modalities IV. Companion course to Nursing 205. Includes complex pharmacology and complex therapeutic treatment modalities used to promote intervention, restoration, and rehabilitation for complex health concerns. (2W)

210. Capstone Nursing. Integration and application of all previous training in the program into a strong clinical experience, including management and administration in nursing. (6Sp)

Health Science 230. Introduction to Pathophysiology. Nature of disease and its effect upon body systems. (4F)

Learning Resources Program

The Learning Resources Program is a strategic academic service organization, whose purpose is to enhance the teaching, research, and service missions of Utah State University. In partnership with academic departments and colleges, research and service units, and administrative divisions, the Learning Resources Program facilitates the University Mission through four central functions: (1) Creating and maintaining core resources, including Library and Information Services, Computing Services, Media Services, and Telecommunications; (2) Facilitating and contributing to the development of educational programs and information systems to promote and extend active learning; (3) Establishing global access to informational, educational, research, and management resources; and (4) Providing and maintaining a University-wide Information Network to deliver voice, data, and video services in support of instruction, research, and extension to classrooms, laboratories, and off-campus facilities.

Administration

Dean, Learning Resources Program: Glenn R. Wilde, 797-1201

Associate Dean: Byron R. Burnham, 797-1637

Budget/Personnel: Jeannie F. Simmonds, 797-3166

Special Projects: Peggy P. Nixon, 797-1134

Library and Information Services

Director: Max P. Peterson, 797-2631

Information Systems: Michelle M. Smith, 797-3977

Divisions

Public and Technical Services: Robert G. Murdoch, 797-2631

- Reference Services
- Circulation Services
- Government Documents
- Cataloging
- Acquisitions
- Serials and Binding

Special Collections and Archives: 797-2663

- Manuscripts
- Archives
- Rare Books and Printed Matter
- Fife Folklore Archive

Audio Visual Services: LaDell C. Hoth, 797-2660

- Media Distribution Services
- Media Collection Development
- Equipment Services

An extensive collection of books, periodicals, and electronic resources are represented in the library's collections. The library has been designated as a regional depository for federal documents, resulting in one of the outstanding collections in the Intermountain West. A diverse collection of local, state, and international documents is also available. Further, the library holds many specialized bibliographies, indexes, indexing and abstracting services, and subscription services crucial to the location of needed materials.

Trained library personnel specializing in reference and documents are available to provide assistance. Through the Interlibrary Services Department, library patrons can access the collections of libraries in this country and around the world. The library is a member of the Bibliographic Center for Research, the Center of Research Libraries, and the Utah College Library Consortium. The Division of Special Collections and Archives contains a significant body of primary source material (manuscripts and rare books) for area studies and for all aspects of the University's history.

Multimedia and Distance Learning Services

Director: Kenneth E. Boutwell, 797-2655

Chief Engineer, Audio and Video Engineering: Rickey D. Hughes, 797-2706

Faculty Assistance Center for Teaching: Elaine Campanella, 797-1013

Provides support to the faculty and the University through the production of various types of distance learning instructional and informational video programs. Teleconferencing and satellite up-linking and down-linking of programs are available to enhance the educational experience, as well as instructional design consultation and complete electronic graphics support, including FACT (the Faculty Assistance Center for Teaching).

Publication Design and Production

Manager: Jeannie F. Simmonds, 797-3166

Head, Printing and Operations: Dale P. Smith, 797-2626

Head, Copy Centers: Remani Rajagopal, 797-2620

As the publication arm of the Learning Resources Program, Publication Design and Production provides the campus community with expertise and service in all printing and publication areas. Duplication services are provided through six on-campus copy centers and graphics laboratories. A full-service printing operation is available for creation of printed University publications.

Photography Service

Manager: Arlen L. "Ted" Hansen, 797-2262

Provides support to the faculty and the University through the availability of photographers, the production of photographic prints and slides, consultation, and specialized photographic services for research and instruction.

Computer Services

Director: Karl A. Fugal, 797-2412
Manager of Technical Services: Kim A. Marshall, 797-2413
Office in SER 325, 797-2391

The Office of Computer Services provides computing/networking facilities and services for teaching, research, library automation, and administrative uses. The centralized equipment provided for use by students, faculty, and staff includes an IBM ES9000 series system, a VMS Cluster of three DEC 3000/400 RISC Alphas, a Micro VAX III, an IBM RS6000/550 numeric intensive computer, and associated peripheral devices including a CalComp 1043GT eight pen plotter. More than 460 microcomputers located in 14 public labs are dedicated for student use. An open access lab, consisting of 20 high-resolution graphics RISC workstations, is also available to students in SER 108.

Computer Services maintains network connections to major national and international networks. These facilities provide super-computer access, data transfer, and electronic mail service to and from nearly every university and college in the free world. An intra-campus fiber optic data communications backbone is maintained and operated by Computer Services. Nearly all campus computers are connected via this facility.

A Computer Services staff of 32 permanent and 60 part-time (student) employees serves diverse user needs. Computer Services offers data entry, as well as plotting and scanning services. Canned computer programs for statistical data analyses, e.g., SAS, SPSS, MINITAB, and mathematical subroutines such as IMSL, are maintained and user consultation is available.

Computer Services periodically offers short courses on computer related skills—computer programming, using canned programs, and using peripheral equipment.

User guides and newsletters are published. All students are entitled to a computer account which is sufficient for meeting their yearly educational computing needs. Students pay a part of the costs to support academic computing through a fee collected at registration time.

Telecommunications and Telephone Services

Director: Scott N. Bradley, 797-0022
Assistant Director for Technical Services: Scott D. Wells, 797-3336
Assistant Director for Business Operations: Delia L. Weeder, 797-0071

Telecommunications and Telephone Services supports the educational and research programs of the University through high quality, cost-effective telephone services, including equipment, line facilities, and access to local and long distance calling networks.

Summer Quarter

Summer Quarter Administrative Committee:

C. Blythe Ahlstrom	Library 109	797-1166
Lynn J. Poulsen	SC 246A	797-1107
Rex L. Tueller	ECC 101B	797-2134

1996 Schedule

Presession: June 10-21
Eight-week session: June 24-August 16
Postsession: August 19-23

1997 Schedule

Presession: June 9-20
Eight-week session: June 23-August 15
Postsession: August 18-22

1998 Schedule

Presession: June 8-19
Eight-week session: June 22-August 14
Postsession: August 17-21

Summer quarter at USU is first in the four-quarter academic year. It is regarded as the *opportunity quarter* because of its provisions for a number of special opportunities for students at all collegiate levels. Short courses, seminars, workshops, and institutes provide students with an excellent and rewarding experience. Distinguished faculty members, including resident and visiting scholars, representing both national and international centers of higher learning, are carefully selected to complement the varied schedule of programs.

High school students who have completed their junior year may initiate programs that will be accredited upon graduation from high school and admission to the University. Recent high school graduates can get a head start on their college experience by attending during summer session.

University undergraduates may continue their coursework to compensate for any course deficiencies or work toward an earlier

completion. Graduate students may initiate, continue, or complete master's and doctorate programs. They may also work on research, prepare theses and dissertations, and take exams during the summer quarter.

Other adults and special students will find the opportunity to participate in enrichment courses, lectures, and numerous special workshops, conferences, and seminars. Educators may meet certification requirements or upgrade previous professional training.

Concern for individual enrichment and professional growth characterizes the summer quarter. Excellent opportunities are afforded for greater options in the university experience.

The full summer quarter consists of an 11-week period. A two-week presession is devoted to workshops and short courses of various kinds. This is followed by an eight-week session of classwork. The eight-week session also is divided into two four-week sessions for some courses. This allows a more intensive but shorter summer session for those with time limitations. Following the eight-week session is a one-week period called the postsession, which is primarily established for workshops and various types of short courses. The eight-week session of classes allows a full quarter's work, customarily amounting to 15 credits of classwork. Thus, the quarter of activities may enable the student to fill his or her program with different kinds of workshop and classwork combinations.

Numerous cultural advantages are available during summer quarter. Recitals, concerts, dramas, and other special events, including the Festival of the American West, the plays of the Old Lyric Repertory Company, the Utah Festival Opera, Alumni Band concerts, and the concerts of Music West, encourage individuals of all ages to participate and enjoy activities that enhance the growth and development of individual talents.

A distinguishing feature of the summer quarter calendar is a program of recreation and enrichment. There are attractive opportunities supplied students in their various interests for out-of-class diversion and change of pace. They include a diversified program of activities such as special tours, games, tournaments, and hikes. Numerous outlets for snacks, relaxation, movies, dances, and parties highlight summer quarter extra-class activities.

Utah State University takes great pride in its attractive green and cool campus. This beautiful area provides an enjoyable haven for those who wish to study quietly out-of-doors, enjoy a casual stroll with friends, or lounge on the lawns beneath the trees. In addition to the inviting campus environs, the nearby scenic canyons, national parks, and monuments all provide special inducements for evening and weekend trips and associating with friends. Such a pleasant climate and environment makes summer study at Utah State University a profitable and enjoyable experience.

School of Graduate Studies

Dean: James P. Shaver

Office in Computer Center 118, 797-1191

The first master's degrees were awarded at Utah State University in 1914, and the first doctorate degrees were awarded in 1950. Graduate programs have increased in response to state and national needs, with growth closely linked to the development of extensive research programs. The School of Graduate Studies is accredited as part of the University accreditation. Many of the departments and programs have also been accredited by their respective professional accrediting agencies.

In the eight colleges, 41 departments offer advanced degrees, including 96 master's degree programs, the Civil Engineer degree, the Electrical Engineer degree, the Educational Specialist degree, and 40 doctoral degree programs. The dean of the School of Graduate Studies, assisted by the Graduate Council, supervises graduate programs. A Graduate Student Senate is active.

Endeavor at the graduate level is directed toward (1) competence in creative activity and research that culminates in a contribution to knowledge; (2) scholarship, including interpretation, organization, evaluation, and application of knowledge; and (3) proficiency in the dissemination of knowledge.

Qualified persons are invited to apply for admission to one of the academic programs leading to a graduate degree. Application forms and graduate catalogs will be sent upon request from: School of Graduate Studies, Utah State University, Logan, Utah 84322-0900.

Student Services

The University provides a number of programs and agencies to facilitate students in their educational pursuits. Related services are also provided. Students are invited to contact the following offices for information about the University, student services, and student-organized activities.

Vice President for Student Services: Val R. Christensen, SC 220, 797-1712

Director, Student Center: Gary A. Chambers, SC 326 797-3137

Director of Housing: Michael D. Black, 1151 East 700 North, 797-3266

Director, Office of International Students and Scholars: Afton B. Tew, SC 313, 797-1124

Director, Parking and Transportation Services: Terry K. Moore, Parking and Visitor Information, 797-3414

Director, Multicultural Student Affairs: April J. Spaulding, SC 311K, 797-1733

Director, Student Publications: Jay C. Wamsley, SC 319, 797-1759

Director, Student Development: Gary A. Chambers, SC 326, 797-3137

Director, Student Health Services: James W. Davis, SC 102, 797-1660

Associate Vice President for Student Services: Joan A. Kleinke, SC 220, 797-1622

Director, Career Services and Cooperative Education: David F. Hart, University Inn 102H, 797-7777

Director, Women's Center: Janet L. Osborne, SC 310, 797-1728

Director, Counseling Services: Mary E. Doty, SC 306, 797-1012

Director, Personal Development Center: Glen H. Maw, University Inn 139, 797-1138

Director, Substance Abuse Prevention/Education: JoAnn R. Autry, UI 127, 797-1010

Coordinator, Testing: Eric W. Jensen, University Inn 115, 797-1004

Assistant Vice President for Student Services: LaVell E. Saunders, SC 302, 797-1132

Director, University Academic Service Center: Melvin H. Larsen, SC 302, 797-1128

Director, General Registration: J. Rodney Clark, SC 302, 797-3373

Director, Learning and Life Skills Center: Noelle A. Call, SC 302, 797-1132

Director, New Student Orientation: Chuck Lopez, SC 302, 797-1125

Director, Student Support Services: Nazih T. Al-Rashid, SC 104, 797-3372

Director, Summer Citizens: Noelle A. Call, SC 302, 797-1128

Director, Disability Resource Center: Diane C. Baum, SC 104, 797-2444

Assistant Vice President for Student Services: Lynn J. Poulsen, SC 246, 797-1107

Admissions Counselor: Rhea H. Wallentine, SC 246, 797-1107

Registrar: Charles L. Olson, SC 246, 797-1014

Director, Financial Aid: Judy LeCheminant, SC 106, 797-0173

Director, High School/College Relations: Mark Tenhoeve, University Inn 101, 797-1129

Scheduling Office: Cindy B. Moulton, SC 246, 797-1140

Veterans Affairs Office: JoAnn Toone, SC 246, 797-1102

Graduation Office: Stanley A. Bodily, SC 246, 797-1112

Records Office: Elizabeth W. Allen, SC 246, 797-1116

Residency Office: Ann N. Gibbons, SC 246, 797-1107

Financial Aid and Scholarship Information

Financial Aid Office

Director: Judy LeCheminant, 797-0173

Office in Taggart Student Center 106

Associate Director: Steven J. Sharp
Assistant Director: Sharon B. Robinette
Assistant Director, Computer Operations: Darrell M. Wilcox
Assistant Director (N-R): Richard Watkins
Counselor (A-C): Janet Bringhurst
Counselor (S-Z): Todd Milovich
Counselor (D-H): Debbie Perrett
Counselor (I-M): Cedra H. Jensen
Scholarship Counselor: Donna M. Eddleman
Loan and Collection Officer: William E. Jensen, Main 21A

Application for financial aid begins in January for any awarding anticipated during the following academic year. In most instances, early application benefits the applicant. Those who apply early have a greater chance of receiving more aid and of having aid available in time to meet school needs. Some aid is available throughout the year. Contact the Financial Aid Office for assistance.

Scholarships are awarded to qualifying applicants who apply on or before March 1, prior to the academic year. Contact Financial Aid Office for exact deadline.

Financial aid programs, policies, and procedures described herein reflect the latest information at publication. Changes may occur in response to state and federal requirements. Appropriate notice will be made whenever possible before any change takes effect.

Grants, Work-Study, and Loans

Federal Pell Grant. Nonrepayable grant up to $2,340 for which all undergraduates must apply before being considered for any other type of federal aid.

Federal Supplemental Educational Opportunity Grant (SEOG). Nonrepayable grant given to undergraduates with need. The maximum award varies yearly. Awarding is based on need and funding.

State Student Incentive Grant (SSIG). For eligible Utah undergraduates. Awarding is based on need and funding.

Other Grants and Special Benefits. Contact the Financial Aid Office for details concerning BIA or Tribal Grants.

Federal Work-Study (CWS). Provides part-time on-campus and some off-campus employment to enable students to earn a portion of their educational expenses during the college year. Awarding is based on the availability of funds; minimum wage is generally paid to undergraduates.

Federal Perkins Loan (NDSL). Undergraduate students generally may borrow up to $1,650 a year, to a total school amount of not more than $9,000. Graduate students may borrow $2,400 per year, up to $18,000. Monthly payments and interest begin after graduation, withdrawal, or otherwise leaving school, or after dropping below 6 credit hours. A 5 percent simple interest rate applies. Awarding is based on need and funding.

Federal Stafford Loan (GSL). Low, variable interest loans made through a lender such as a bank, credit union, or savings and loan association. Freshmen may apply for up to $2,625 each regular school year; sophomores may apply for up to $3,500 a year; juniors, seniors, and second bachelor's may apply for up to $5,500 a year; and graduates may apply for up to $8,500 a year. Aggregate borrowing limits are $23,000 for undergraduates and second bachelor's, and $65,500 for graduates. Monthly repayment begins after completing or leaving school, or after dropping below 6 credit hours. Interest accrued prior to the beginning of repayment is paid by the federal government for "subsidized" Federal Stafford Loans. Maximum repayment period is 10 years.

PLUS Loans. PLUS loans are for parents who want to borrow for their children's education. This loan provides additional funds for educational expenses and, like Stafford loans, is made through a lender such as a bank, credit union, or savings and loan association. Repayment begins within 60 days after the last loan disbursement. This variable interest loan has an interest rate cap of 10 percent. This loan is available when other awarded federal aid to the student does not fully meet the school's estimated cost of education.

Emergency Loan. Emergency money up to $500 is available for USU students with fees paid for at least 6 credit hours. Emergency loans are not available for tuition. The duration of emergency loans is ten weeks. A low rate of interest, or service charge, applies.

Method of Awarding Financial Aid

The Financial Aid Office determines a student's yearly cost of education at Utah State University. Residency status has bearing on this cost figure. The student's **family contribution** (the student's financial resources and expected help from family members) is subtracted from the **cost of education.** The **family contribution** is derived from the information provided in the federal financial aid application. Once the application process is completed, using a congressional methodology and processing schedule, the student's **financial need** is determined as the difference between the cost of education and the family contribution. Awarding is based on this difference and available funding.

Estimated Cost of Education for Three Quarters (1995-96 Financial Aid Budgets)

	Resident	Nonresident
Tuition and Fees[1]	$1,995	$ 6,045[2]
Room and Board	4,305	4,305
Books and Supplies	720	720
Personal Expenses	1,500	1,500
Transportation	1,050	1,050
Totals	$9,570	$13,620

[1]See complete schedule of tuition and fees in the Enrollment Services section, pages 11-13.

[2]See tuition and fee schedule for international students, page 11.

Refund and Repayment Policies

Students who withdraw during the quarter may be required to repay a portion or all of any financial aid received. Consideration is given to the time of withdrawal in the quarter and the reason for withdrawing. Students who receive a Perkins or Stafford Loan are required to have an exit interview when withdrawing from school. See the Enrollment Services section of this catalog for information on refunding of registration fees.

Responsibility of Financial Aid Recipients

Undergraduate financial aid recipients are expected to achieve a USU GPA of at least 2.0 (3.0 for graduate students), and register for and complete at least 12 credits (6 credits for graduate students) each quarter of awarded grant[3], Perkins Loan, or Work-Study aid. The Stafford loan requires a minimum of 6 credits quarterly to receive and maintain the award. Students not maintaining either the quarterly credit or the required grade point average will be placed on financial aid probation for a minimum of one quarter. Students not meeting the required minimums during the period of probation will be suspended from further aid. In exceptional circumstances, students may appeal to have the suspension lifted.

In addition to maintaining academic progress as defined above, recipients may not owe a refund on grants previously received, or be in default of any student loan fund at USU or any other institution.

Scholarship Policy

Who can apply. The scholarships listed are those consistently available to Utah State University students. They are awarded through the services of the Financial Aid Office and through the various colleges and academic departments. Some scholarships are awarded without restriction, while others may be limited by certain majors or colleges, class standing, minimum grade point, past accomplishments, financial need, or special qualifications established by the donor. College students, including transfer students, are evaluated on the basis of their college cumulative grade point averages. Students entering from high school are judged on the basis of their high school grade point average and scores from the American College Test (ACT). The ACT test should be taken by at least October of their senior year. A four-point scale is used to determine the cumulative GPA. The scholarship application deadline is March 1.

Waiver Scholarships. These scholarships pay full or partial tuition, provided the undergraduate student is registered for 12 or more credits. Three types of waiver scholarships are offered by USU. (1) *Academic Scholarships* are awarded to incoming students showing academic excellence. (2) *Achievement Scholarships* are awarded to incoming students with exceptional talents, selected student leaders in high school or junior college, or students with regional or national credentials. (3) *University Academic Scholarships* are awarded to students who are or who have been students at USU. Such applicants compete with other students within their college on the basis of their academic records.

Donor Scholarships. Students applying for these scholarships should list them on their scholarship applications, in addition to any applications for the waiver scholarships listed above. Donor scholarships are listed on pages 240-252.

[3]Part-time students (less than 12 credit hours) may be eligible for and be awarded Pell Grant aid, but in smaller amounts.

Scholarships and Grants-in-Aid

The following are awarded principally to new students:

African-American Leadership Scholarship. An annual scholarship awarded to a graduating high school senior who is an African-American, a Utah resident, and a U.S. Citizen. Recipient must have demonstrated leadership, both in high school and the community, and must have shown special talent and the potential for continued leadership. To receive this $500 cash award, recipient must carry at least 12 credit hours per quarter. For application and more information, contact the Office of High School/College Relations.

Alumni Scholarships. Scholarships established by the class of '39 to help offset the cost of nonresident tuition for the children of out-of-state alumni. Primarily for nonresident students who may not qualify for other academic scholarships. For application and more information, contact the Office of High School/College Relations.

Army ROTC Scholarship. Two-, three-, and four-year scholarships pay full tuition, books, laboratory fees, and a tax-free subsistence allowance of $100 per month. Includes free housing, if used at USU. Contact Military Science Department for information and application. Applications can be picked up starting December 1.

Ezra Taft Benson Scholarship. For entering resident freshmen with a high school grade point average of at least 3.8 and an ACT score of at least 31. High moral standards must be verified by two letters of recommendation. For application and more information, contact the Office of High School/College Relations.

Dee and Belva Broadbent Scholarship—Wasatch High School. Awarded to one boy and one girl graduating from Wasatch High School in Heber City, Utah, to be used for enrollment at Utah State.

Marie Eccles Caine Scholarships. Scholarships for incoming freshmen with abilities in the arts. One scholarship will be given to a graduate of each of the following high schools: Bear River, Box Elder, Logan, Mountain Crest, Preston; and Sky View. Recipients must major or minor in the arts. For application and more information, contact the Office of High School/College Relations.

Laurence and Florian Cazier Blackett Scholarships. Awarded to students who demonstrate financial need and can show personal integrity. For application and more information, contact the Office of High School/College Relations.

USU Classified Employees Scholarship. An annual scholarship awarded to a son or daughter of a classified employee. Recipient must be an undergraduate and must carry at least 12 credit hours per quarter. Contact Ardith Poulsen, FAV 230, for further details.

USU 4-H Achievement. Applicants must have been members of 4-H at least two years and must be Utah residents. Available to high school senior or college undergraduate planning to enroll at USU the following fall quarter for the first time. Applications are due January 15.

J. Wayne and Roberta H. Fronk Scholarships. Recipients must be graduates of Bear River High School majoring in Elementary Education, Engineering, Business, or Humanities, and must demonstrate financial need. For application and more information, contact the Office of High School/College Relations.

Leo Hawks Scholarship. Recipient must be a graduate of Preston High School. For application and more information, contact the Office of High School/College Relations.

Von H. and Elaine Y. Jarrett 4-H Scholarship. Financial aid for current or former 4-H members attending USU. Contact supervisor of USU 4-H program for details.

The Weston G. Henrie Scholarship Fund. One or more scholarships are awarded annually to seniors from Logan High School attending Utah State University who have demonstrated high academic achievement in social studies. The scholarship is established in honor of Mr. Henrie who teaches social studies at Logan High School. For application and more information, contact the Office of High School/College Relations.

Melba Brunt Lewis Scholarship. Awarded during alternate years to graduate women from Skyline and Idaho Falls High Schools, in Idaho Falls. The four-year award will be made based on the following criteria: academic—50%, sensitivity to the feelings of others—30%, and financial need—20%.

Jason Messerly Memorial Scholarship. Awarded to a graduating senior from Weber High School who has demonstrated leadership abilities during his or her high school career.

E. A. Miller Inc. and Conagra Inc. Scholarship. Applicants should demonstrate academic achievement, financial need, and personal integrity. First priority will be given to employees and dependents of E. A. Miller. For application and more information, contact the Office of High School/College Relations.

Native American Scholarship Fund. Established by the United Inter-Tribal Council to provide scholarships for Native American Indian and Alaska Native students attending USU at both the undergraduate and graduate level. Applicants must be able to demonstrate high scholastic achievement in secondary and postsecondary education. For application and more information, contact the Financial Aid Office.

Melvin Ronald Olsen Scholarship. Recipient must be a male graduate of Snow College and must not be a member of the LDS Church. For application and more information, contact the Office of High School/College Relations.

President's Leadership Council Scholarship. Four-year scholarships awarded to high school leaders. For application and more information, contact the Office of High School/College Relations.

Quadrangle Scholarship. Applicants may not receive another scholarship or tuition waiver. Awards are available to graduate, undergraduate, international, classified dependent, and re-entry students. Applications are available in the Office of Financial Aid.

Woodey B. Searle Scholarship. A tuition scholarship is awarded each year by Woodey B. Searle to a needy and deserving graduate of the Uintah High School. Applications should be filed before April 15 with the principal of the UHS at Vernal.

Elaine and Conway Sonne Scholarship. Awarded to a graduating high school senior who is a U.S. citizen. Applicant must have demonstrated leadership both in high school and in the community.

Southern California Alumni Scholarship. Awarded to entering freshmen from the Southern California area who demonstrate academic achievement, financial need, and personal integrity.

Summer Citizens Scholarship. Applicants should demonstrate financial need and academic achievement. Recipients must be graduates of Sky View, Mountain Crest, or Logan High School. Applications are available from high school counselors.

Dr. W. C. Swanson Family Foundation Scholarship. Student recipients should display academic achievement, leadership traits, financial need, and personal integrity. Awards are made to reentry (nontraditional) students, minority students, and incoming freshmen. For application and more information, contact the Office of High School/College Relations.

Tuition Scholarships. The President of the University is authorized by Title 53, Chapter 34, Section 1-a, Utah Code Annotated, 1953, to waive registration and tuition fees in full or in part for a limited number of meritorious or impecunious students who reside in Utah. For application and more information, contact the Office of High School/College Relations.

Union Pacific Scholarships. The Union Pacific Railroad awards four scholarships annually to seniors in high school who are enrolled as 4-H Club members and four to FFA members. These $500 scholarships are available in the following counties: Beaver, Box Elder, Cache, Davis, Iron, Juab, Millard, Morgan, Salt Lake, Summit, Tooele, Utah, Wasatch, and Weber. Applications are due January 15. For more information, contact 4-H Club.

University Club Scholarships. The University Scholars Program offers the most prestigious scholarships awarded at Utah State University. Each year 20 scholarships are awarded to students who attend a competition held on campus. The scholarship pays tuition and $2,400 per year. In addition, 10 scholarships are awarded by the individual colleges with a cash stipend that varies from $300 to $1,250 per year. For more information and an invitation, contact the High School/College Relations Office.

Alice Fonnesbeck Gardner and Sharon Gardner Ellis 4-H Scholarship. Financial aid for students participating in the 4-H program. Contact supervisor of USU 4-H program for details. Applications due January 31.

USU 4-H Merit Scholarships. Two $1,500 scholarships to outstanding 4-H members, who must be Utah residents. Contact 4-H office for further details. Applications are due January 15.

Women's Center Scholarships and Grants. Awards are based on need, proposed academic and personal goals, and scholarship. Four types of awards are available: **Encouragement Grants.** For women or men who are attending college for the first time and have a gap of at least five years since finishing high school. Must be enrolled for a minimum of 3 credits. Undergraduates only. Residents or nonresidents. **Re-entry Grants.** For women or men who have a gap of at least five years at some point in their education, but have been attending college for at least one quarter. A 2.5 GPA is required. Must be enrolled for a minimum of 6 credits. Undergraduates only. Residents or nonresidents. **Traditional Grants.** For senior or graduate women. Must have a 2.5 GPA or a 3.0 GPA respectively. Must be enrolled for a minimum of 6 credits. Residents or nonresidents. **Tuition Waivers.** For women or men who have a five-year gap at some point in their education. A 3.0 GPA is required. Must be enrolled for a minimum of 12 credits. (Any credits over 18 are not covered.) Undergraduates and Utah residents only. Apply in the Women's Center/Re-entry Student Center, SC 310.

The following are awarded principally to students already enrolled:

Utah Air Force Association Scholarship. For use in the junior or senior year by students in engineering or science majors. Applicants must have 3.0 cumulative GPA and 3.5 GPA in major, and include on application how they have or expect to contribute to the nation's aerospace efforts. The scholarship, equal to in-state tuition amount, is given to USU students every third year, beginning with the 1985-86 academic year. For information, contact the College of Engineering.

Air Force ROTC Scholarship. Arranged for two to four years, this scholarship pays for tuition, fees, books, and $300 towards a room contract, plus a nontaxable allowance of $100 per month. Contact USU Air Force ROTC for application and further details or call 797-1834.

Elmer Aldous Memorial Fund Rodeo Club Scholarship. Established by family and friends in memory of USU student Elmer Aldous. Contact Dan Christensen for further details.

The Lieutenant Clyde Parker Baugh Memorial Fund. A gift of Mr. and Mrs. Wilford F. Baugh in memory of their son Clyde Parker Baugh, it provides scholarships annually for deserving students of high scholarship and leadership. Apply in the Financial Aid Office by March 1.

Robert K. Baum Engineering Scholarship. Two $500 scholarships provided for two students in the College of Engineering. Preference given to graduates from Wasatch High in Heber City, Utah, for two individuals with disabilities. Contact Disability Resource Center, SC 104.

The 1927 Class Gift to the College. This yields an annual income sufficient to provide four scholarships. Application should be made by juniors and seniors. Apply in the Financial Aid Office by March 1.

Continuing Student Scholarship. Available to continuing USU students who have attended at least three but not more than six quarters after the spring quarter prior to the school year for which applying. Apply in the Financial Aid Office by March 1.

Gore Memorial Foundation. Several scholarships offered annually to students with documented hearing impairments. Award based on academic standing and financial need. Contact Disability Resource Center, SC 104.

Marriner S. Eccles—Emma Eccles Jones Scholarship Fund. The Marriner S. Eccles Scholarship Fund and the Emma Eccles Jones Scholarship Fund were established by the individuals after whom the funds are named and are intended to help deserving students of Spanish-American or Black descent obtain a college education. The scholarship awards are administered by the Financial Aid Office, but the selection of the award recipients is made by a special committee designated for the purpose. To be eligible for consideration, an applicant must (1) be a citizen of the United States; (2) be of Spanish-American or Black descent; (3) be capable of succeeding in a University program; and (4) be able to demonstrate need of assistance. The maximum award for one year shall be $1,000 and may be continued if the student applies and is successful. More information and applications are available in the Student Services Office, SC 220.

The Johansen Scholarship Fund. A gift of Johana Johansen, this provides scholarships annually, worth in the aggregate from $125 to $150, for help to worthy students of junior and senior rank. Apply in the Financial Aid Office by March 1.

Martin Luther King Fellowship. Available to black graduate students attending Utah State University. Presented through the graduate office. Apply in the School of Graduate Studies Office, Computer Center 108.

Lao-American Scholarship Fund. For students at USU who are native to Laos and eligible for acceptance into a USU degree program at any level who will study agriculture, education, engineering, forestry, or public health. More information and applications are available in the Student Services Office, SC 220.

Helen Lundstrom Scholarship. Given in honor of Dean Lundstrom, this aid is for an undergraduate or graduate female student with high academic standing. Applications are available in the ASUSU Office, SC 326.

Merrill O. Maughan Scholarship Fund. One or more scholarships given annually to returned LDS missionaries who have served 18 months or two years in the mission field who are in need of financial aid. Apply in the Financial Aid Office by March 1.

Mortar Board Scholarship. Offered to members of Mortar Board, this scholarship can be used for senior year or graduate study. Apply through Mortar Board officers or advisers.

Emma Mosher Scholarship. Unrestricted. Apply in the Financial Aid Office by March 1.

N. Glen Neeley Scholarship. Nathan Glen and Deta P. Neeley established, in their will, scholarships for worthy students. Apply in the Financial Aid Office by March 1.

Harold L. Nielson Scholarship. Memorial scholarship offered to one or two students with documented vision impairments. Award based on academic standing and financial needs. Contact Disability Resource Center, SC 104.

Phi Kappa Phi Scholarship. A $125 cash award given to one or two junior students of high scholarship and outstanding character. Given only upon recommendation of Dean.

T.G. Rechow Scholarship. Unrestricted scholarships established in their will by the Rechows. Apply in the Financial Aid Office by March 1.

Harriet Smith Scholarship. Unrestricted. Apply in the Financial Aid Office by March 1.

Lynn H. Stevens Scholarship. This $125 scholarship is given to an outstanding military science student who will be enrolled in the advanced program. He or she must also show a desire to serve in the U.S. Army as a commissioned officer, pass entrance requirements for advanced course Army ROTC, have an academic standing of a minimum of 2.5 overall grade point average, and be selected by the professor of military science.

Utah State University Emeriti Scholarship. Application should be made by freshmen students who have superior academic qualifications. Applicants must be related to an Emeriti member. For more information, contact Alumni Relations, 797-2055.

The Wallace R. Wayman Memorial Scholarship Fund. From an endowment established by Mr. Wayman, these funds are to help needy students attending USU. Apply in the Financial Aid Office by March 1.

College of Agriculture
Scholarships and Awards

Applications for the following scholarships and awards are available at the College of Agriculture Dean's Office, Agricultural Science 223.

Allen N. and Helen Adams Scholarship. Three scholarships awarded to students who demonstrate academic excellence, financial need, and personal integrity. One scholarship awarded in animal physiology and breeding, one in animal management and extension, and one in animal nutrition.

Agricultural Dean's Leadership Award. Three quarters of in-state tuition waiver. To be eligible, the student must (1) have served as or be currently serving as the state of Utah FFA president, (2) have a high school GPA of 3.00 or higher on a four-point system, (3) enroll as a full-time student with courses leading toward a degree in an approved major in the College of Agriculture at USU, (4) maintain a GPA of 3.00 or higher each quarter in order to use the waiver the subsequent quarter, (5) submit a scholarship application and a transcript of high school and college credits (indicate the years served as state FFA president). These documents should be submitted on or before April 1 of the calendar year prior to the first quarter when the waiver is used, and (6) have no other tuition waiver for the quarters this award is to be used.

Agricultural Economics Scholarship. Awards for students majoring in agricultural economics or agribusiness, based on scholastic achievement, need, and performance.

Agricultural Systems Technology and Education Department Scholarships. Scholarships or tuition waivers for students majoring in agricultural education and agricultural mechanics.

Alumni Association Scholarships. College of Agriculture Alumni Association scholarship awards of $600 to students demonstrating academic achievement, financial need, and personal integrity.

American Breeders Service Award. One or more awards to deserving students currently enrolled in the Dairy Herdsmen program, based on scholarship, need, leadership, and interest in becoming a dairy herdsman.

Melvin E. Anderson Scholarship. An annual scholarship awarded to a junior, senior, or graduate student in the Department of Plants, Soils, and Biometeorology to honor the late Melvin E. Anderson. Special consideration will be given to students majoring in horticulture or plant breeding. Recipients should demonstrate academic achievement, financial need, and personal integrity.

Fred A. and Ruth L. Bingham Scholarship. An annual scholarship awarded to an undergraduate student majoring in some field of agriculture. The award is based on high academic standards, superior potential, personal integrity, and a high sense of social and moral responsibility.

Wayne and Lucille S. Binns Scholarship. An endowed scholarship awarded to a junior majoring in Animal, Dairy, or Bioveterinary Science who demonstrates academic achievement, personal integrity, and a high sense of social and moral responsibility.

Ralph S. and Deora Anderson Blackham Scholarship. An endowed scholarship awarded to undergraduate or graduate students studying agriculture. Awards are based on scholarship, accomplishments, and financial need.

George T. and Eva B. Blanch Memorial Fund. This scholarship is to be given to upper-division students in agricultural economics with demonstrated academic ability, financial need, and personal integrity.

J. Grant Broadbent Award. One or more awards for students of sophomore, junior, or senior standing on the basis of their potential for making a significant contribution to the range livestock segment of agriculture. They must demonstrate leadership and scholarship.

Cache Valley Cooperative Scholarship. These funds are for graduate students in dairy science, agricultural economics, and sociology involved in studies on farm cooperatives. Contact department head for details.

Cache Valley Select Sires Award. One or more awards to deserving students currently enrolled in the Dairy Herdsmen's Program, based on scholarship, need, leadership, and interest in becoming a dairy herdsman.

George B. Caine Dairy Memorial Scholarship Award. One or more scholarships are awarded annually to outstanding upper-division dairy students as determined by scholarship, leadership, and need. Prof. Caine was the founder and first department head of dairy science at Utah State University.

Evan B. Campbell Scholarship. Awarded to students showing commitment and desire to pursue an education in the College of Agriculture, as demonstrated by extracurricular activities in youth organizations, religious and community service, and academic achievement.

CENEX Cooperative Studies Scholarships. Awards of $600 each for students completing one-year and two-year applied technology programs who complete an agribusiness internship work experience. First-year recipients are eligible for a second year award.

CENEX Foundation Agribusiness Scholarships. Three awards of $750 each for junior or senior students in agriculture who have had academic instruction in farm cooperatives, based on scholastic achievement and leadership qualities, rather than on financial need. Awarded to students from the following states: Colorado, Idaho, Iowa, Kansas, Minnesota, Montana, Nebraska, North Dakota, Oregon, South Dakota, Utah, Washington, Wisconsin, or Wyoming. If awarded to juniors, a $750 scholarship will

be available for their senior year, subsequent academic year only, providing they still meet the scholarship criteria.

Richard L. Chase Memorial Scholarship. An award from an endowment fund provided by family, friends, and colleagues of Richard L. Chase is given to an undergraduate student in the Department of Plants, Soils, and Biometeorology who has expressed an interest in weed science. Selection is based on academic achievement and professional potential.

Hung Wo Ching Scholarship. One or more scholarships awarded to students majoring in agricultural economics or agribusiness management. Awards are based on academic acheivement and professional promise.

Kenneth D. Christensen Scholarship. A scholarship awarded to an outstanding student in the Department of Plants, Soils, and Biometeorology majoring in agronomy. Student recipients should demonstrate academic achievement, financial need, and personal integrity. Established to honor the late Kenneth D. Christensen, former chairman and president of Northrup, King & Co.

Alfred E. Clarke Scholarship. A scholarship awarded to an outstanding student in the Department of Plants, Soils, and Biometeorology who demonstrates academic achievement and financial need. Established through the estate of the late Violet May Lory in honor of her late brother, Alfred E. Clarke.

William C. Claypool Scholarship. Awarded to a graduate student at USU whose thesis is directed toward the study of some problem of significance to the agriculture of Cache Valley.

Dairy Industries Scholarships. Awards for dairy students based on past academic achievements and demonstrated interest in and experience with the dairy industry. The number and amount of each scholarship is dependent on available funds.

Dairy Heifer Contest. Several scholarships are awarded each year based on student performance in a written test and an interview. Contributors include Utah State University, Utah Holstein Association, Cache Valley Select Sires, Trenton Feedlot, Intermountain Farmer's Association, and other individuals and organizations.

Davis County Master Gardener Association Scholarship. A scholarship will be donated to a junior, senior, or graduate student in the Department of Plants, Soils, and Biometeorology. Special consideration will be given to students in horticulture and students from Davis County. Recipients should demonstrate academic achievement, financial need, and commitment to service.

Wade G. Dewey Scholarship Award. One or more scholarships will be provided to outstanding junior or senior students from the Plants, Soils, and Biometeorology Department who have a special interest in agronomy and plant breeding. Selection is based on academic performance and potential for professional achievement. These awards are provided by the Utah-Idaho Grain Exchange Endowment established in honor of Dr. Dewey for his contribution to the improvement of cereal grains for the Intermountain Region.

First Security Foundation Scholarship. Scholarship(s) awarded to a student(s) in agriculture during his or her sophomore or junior year based on merit and need.

Carl O. and Genial Lund Frischknect Award. The recipients of this award should demonstrate academic achievement, financial need, and personal integrity.

Grace Williams Funk and Kaye Funk Scholarship. Awarded to a Utah resident senior or graduate student in the field of clothing and textiles or food service management.

Niranjan R. and Josephine N. Gandhi Scholarships. Scholarships awarded to outstanding undergraduates and graduate assistants in the Department of Nutrition and Food Sciences.

Edwin Gossner, Jr. Family Scholarship. Awarded to juniors or seniors pursuing a degree in either dairy production or dairy processing in the College of Agriculture. The candidate's GPA should not be less than 3.0, nor should GPA be the major criteria for selection. Recipients chosen by the scholarship selection committee of the College of Agriculture.

Heber Valley Livestock Foundation Scholarship. Awarded to a graduating senior attending Wasatch High School, located in Heber, Utah, or to the child or grandchild of a graduate of Wasatch High School.

Andrew L. and Corinne G. Heggie Award. An annual award provided by the Heggie family to be given to a student in the Department of Plants, Soils, and Biometeorology. Recipients will be selected based upon potential in the field of dry land farming, personal integrity, and a high social and ethical sense of responsibility. GPA is a secondary consideration.

Dan and Lloyal Hunter Scholarship. Awards for students majoring in agricultural economics or agribusiness. The award is based on academic performance and professional promise.

Industry Sponsored Scholarships for Agricultural Machinery Technology Students. Awarded to students in the Agricultural Machinery Technology program on the basis of need, leadership, scholastic abilities, and areas of specialization.

Institute of Food Technologists Scholarships. Scholarships of $500-1,000 are available on a nationally competitive basis for students in accredited food science and food technology programs.

Frank H. and Pearl L. Jackson Agricultural Endowment Scholarships. One or more scholarships awarded annually to assist future generations of students in the College of Agriculture. Students should demonstrate financial need, personal integrity, quality academic achievement or potential, and a strong sense of performance commitment.

David S. and Retta W. Jennings Scholarship. An annual scholarship is awarded to an undergraduate or graduate student in the Department of Plants, Soils, and Biometeorology to honor David S. and Retta W. Jennings. Special consideration will be given to students majoring in soil science. Selection is based on academic performance, financial need, and worthiness.

R. Paul and Lorna Larsen Scholarship. Awarded to outstanding Utah students who are majoring in horticulture. The scholarships are based on scholarship, need, and commitment to horticulture.

Glenn E. Leggett Memorial Scholarship. One or more scholarships established by Mrs. Glenn E. Leggett to honor her late husband's work in soil fertility and plant nutrition. Scholarships, based on scholastic achievement, are awarded to students who are majoring in the Department of Plants, Soils, and Biometeorology who have an emphasis in soil fertility and/or plant nutrition.

Lewiston State Bank Scholarship. A yearly award of $500 to a junior or senior student in the College of Agriculture.

Hyrum J. MacKay Award. Recipients of this award should demonstrate academic achievement, financial need, and personal integrity.

Milton A. Madsen Memorial Scholarship Fund. An award is given to an undergraduate student majoring in Animal Science, awarded on the basis of scholarship, need, and dedication to the livestock industry. This fund was established by family, friends, and colleagues as a memorial to Dr. Madsen's contributions to the livestock industry and USU.

Arthur W. Mahoney Scholarship. Awarded to a student majoring in Nutrition and Food Sciences demonstrating academic acheivement and financial need.

Arola B. McDonald Dietetics Scholarship. Award of one year's tuition and fees to an undergraduate student, majoring in Nutrition and Food Sciences with a dietetics emphasis, to further training in this field of study.

Marriner Wood Merrill Endowment. Awarded to a student demonstrating quality academic achievement, superior potential, personal integrity, and a high sense of social and moral responsibility.

Darwin Nielsen Scholarship. One or more scholarships to be awarded each year for use in the junior or senior year, on the basis of scholarship and participation in the USU Rodeo Club as a member in good standing.

Major A. and Lucy Nilson Scholarship. Student recipients of the Nilson scholarship must have agricultural backgrounds and must be enrolled in the preveterinary program in the Animal, Dairy and Veterinary Sciences Department.

John E. and Ruth M. Osguthorpe Scholarship. A scholarship from an endowment fund initiated by John and Ruth Osguthorpe will be given to a student in the Department of Plants, Soils, and Biometeorology who has special interest in agronomy. Selection is based on academic achievement, financial need, and personal integrity.

William W. Owens Scholarship. A scholarship awarded to senior or graduate students in dairy science who demonstrate academic achievement, financial need, and personal integrity.

Pacific Northwest Plant Food Association. A scholarship of $500 is given to a sophomore or junior student majoring in agronomy. Offered competitively with other universities.

W. Horace Palmer Scholarship. Student recipients of the Palmer Scholarship must be graduates of Milford High School in Milford, Utah. The student must be enrolled at Utah State University and must have a major within the College of Agriculture. Preference is given to a student enrolled in dairy production. The student must have a GPA of at least 3.5 and must demonstrate financial need.

Pepperidge Farm, Inc. Scholarship. One or more awards for students in food science based on scholarship and dedication to the food industry.

Department of Plants, Soils, and Biometeorology Scholarship. Awarded to outstanding undergraduate students majoring in the department. Selection is based on academic performance and potential for future contributions in agriculture. Special consideration will be given incoming freshmen and transfer students.

Lorin D. Pollard Memorial Scholarship. One scholarship given annually in memory of Lorin Pollard by his parents. Awarded to a student demonstrating quality academic achievement, superior potential, personal integrity, and a high sense of social and moral responsibility. Recipient must be a junior or senior returned LDS missionary.

The Charles Redd Foundation Scholarships. Awarded to agricultural undergraduate students based on need, academic achievement, personal integrity, and responsibility.

Rolla M. Rich Memorial Fund. The interest derived from this fund is to be awarded to a senior student who is a member of the Agriculture Council.

Nelson Ricks Creamery Company Scholarships. Two awards of $500 each to outstanding freshmen majoring in food science with an interest in dairy processing.

Ritewood Inc. Award. Two awards given annually to students majoring in Nutrition and Food Sciences, one with emphasis in nutrition and the other with emphasis in food science.

Ritewood Inc. Scholarship Endowment. Provides annual awards to a nutrition student and a food science student in the Department of Nutrition and Food Sciences.

Seely-Hinckley Scholarship. A scholarship established as a memorial for John H. Seely and Robert H. Hinckley. Awards based on superior achievement and financial need.

Stouffer's Scholarships. Awarded to students in the food sciences area of Nutrition and Food Sciences.

Joseph C. Street Fund in Toxicology. Established in memory of Prof. Street, this endowment is for graduate students majoring in toxicology to attend scientific meetings in their profession. Contact program chairman for details.

Sterling A. Taylor Memorial Scholarship. One or more scholarships donated by Frances Taylor and friends to honor Sterling A. Taylor. Awarded to an outstanding sophomore, junior, or senior in the Department of Plants, Soils, and Biometeorology with special consideration given to students majoring in soil science or biometeorology. Selection is based on high scholastic standing, leadership qualities, and potential in the field of soils or biometeorology.

Utah Dairy Commission. One or more scholarships awarded annually to outstanding junior or senior students majoring in a dairy curriculum or a closely related agricultural major dealing with production, processing, product development, or marketing.

Utah Farm Bureau Federation Scholarships.

a. President's Award. An award of $600 to an undergraduate student in agricultural production.

b. Leadership Award. An award of $600 to the student who has exhibited the greatest measure of growth and excellence in scholarship, constructive organization, and leadership in the College of Agriculture through university courses.

Utah Feed Manufacturing and Dealer's Association Award. A cash award to an outstanding senior with a major in some phase of animal science, preferably one interested in animal nutrition.

Utah State Garden Club Scholarship. A scholarship will be awarded to a junior, senior, or graduate student in the field of plant sciences. Student must be a Utah resident and should demonstrate academic excellence.

Harris O. and Eleanor Van Orden Endowed Scholarship. Awarded to an undergraduate student majoring in Nutrition and Food Sciences with high academic records.

John Shaw Welch Scholarship. An annual award to a graduate student doing research work in plant-source food for human consumption with emphasis toward natural fertilizer and pest control. In addition, the candidate must demonstrate academic achievement and personal integrity.

Ethelwyn B. Wilcox Human Nutrition Scholarship Fund. Awarded to a sophomore through graduate level student in Nutrition and Food Sciences majoring in human nutrition. Student must have maintained superior grades for the preceding academic year and must demonstrate need related to educational costs.

Robert L. Wrigley Scholarship. Awarded to a student majoring in animal husbandry. The award is based on academic achievement, financial need, and personal integrity.

Dale W. and Adele Young Agricultural Systems Scholarship. For use by undergraduate or graduate students majoring in Agricultural Systems Studies and intending to pursue a career in the agricultural chemical industry or associated agricultural systems technologies such as conservation tillage systems.

Dale W. and Adele Christensen Young Scholarship. A scholarship provided through an endowment fund established by Dale and Adele Young. Given to outstanding students in the Department of Plants, Soils, and Biometeorology who have special interest in horticulture or agronomy. Special consideration given to students interested in pursuing a career in the agricultural chemical industry or associated agricultural technologies. Selection is based on superior potential, quality academic achievement, personal integrity, and a high sense of social responsibility.

College of Business

Undergraduate Scholarships

More than $90,000 in scholarships and tuition waivers are awarded annually in the College of Business. Included in this amount are contributions from the following:

Delonne and Margaret Anderson Scholarship. A $1,000 scholarship awarded to a deserving student.

APICS Scholarship. A $500 scholarship to be awarded to a deserving production major.

James E. Brown Scholarship. A $750 scholarship awarded to a deserving production major.

Professor Vernon M. Buehler '41 Scholarship Honoring Brent Sandberg '85. Annual scholarship based on the earnings of the endowment will be awarded each year to an undergraduate accounting major with promising leadership potential and above average scholastic record.

Professor Vernon M. Buehler '41 Scholarship Honoring Dr. Larzette G. Hale. Annual scholarship awarded to a graduate or undergraduate accounting major with promising leadership potential and above average scholastic record.

Vernon M. and Maree C. Buehler Endowed Scholarship. A $500 scholarship awarded to an Accounting major.

Herschell K. Bullen Scholarship. A $500 scholarship to be awarded to a deserving student.

Business Council Scholarships. Four $300 scholarships funded by the Business Council fund-raising projects.

Business Information Systems and Education Scholarships. One-quarter tuition waivers to entering freshmen or transfer students based on academic achievement and an interest in programs in the Business Information Systems and Education Department. Funds provided by the Annual Office Symposium.

Orson A. and Rae N. Christensen Scholarship. Two $300 scholarships to be given to College of Business students who show scholarship, integrity, and leadership.

Darrell and Jean Deem Scholarship. A $700 scholarship awarded to a deserving student.

Farmers Insurance Group. A $600 scholarship awarded to a deserving student for academic achievement.

First Interstate Bank Scholarship. A $1,275 scholarship based on scholastic attainment, need, and parental residence in Utah.

First Security Foundation Scholarship. Two $1,500 scholarships awarded to students of junior or senior standing who are studying banking and finance.

Russell Hanson Business Scholarship. A $200 scholarship awarded to a deserving student for academic achievement.

Floris B. Henderson Scholarship. A $350 scholarship awarded to a student in business education.

David and Barbara Hulme Accounting Scholarship. A $300 scholarship awarded to a deserving accounting major.

Vernon L. Israelsen Scholarship. A $250 scholarship awarded to a junior or senior student majoring in economics, based on academic promise, character, and citizenship.

Key Bank Scholarship. A $1,000 scholarship awarded to a deserving student.

Steve Milovich, Sr. Scholarship. Two $500 scholarships awarded to deserving students.

Gus Papanikolas Scholarship. A $250 scholarship awarded to a deserving student.

Seely-Hinckley Scholarship. A $1,500 scholarship for a student with superior academic credentials with a clearly defined program leading to graduate work.

Beatrice Dayton Simmons Scholarship. A $1,000 scholarship awarded to a student who has demonstrated quality academic achievement as well as social and personal integrity.

Harold and Grace Steed Scholarship. A $1,000 scholarship awarded to a business major with student government experience.

Bert L. and Barbara Palmer Thomas Scholarship. Two $1,670 scholarships awarded to outstanding upper-division students.

H. Ward and Helen Roghaar Thomas Scholarship. A $250 scholarship awarded to a student in business.

Timothy Roghaar Thomas Scholarship. A $300 scholarship awarded to a student of junior or senior standing who is majoring in accounting.

University Club Scholar. A four-year scholarship consisting of three-quarter tuition waiver plus fees. Awarded to an outstanding entering freshman selected in competition by the College of Business Scholarship Committee.

Robert L. and Patricia W. Wangsgard Scholarship. A $1,000 scholarship awarded to a deserving student.

Western Association of Food Chains Scholarship. An $850 scholarship awarded to a deserving student.

Graduate Scholarships

Arthur Andersen & Co. Scholarship. A $1,000 graduate scholarship awarded to a student majoring in accounting.

Coopers & Lybrand Scholarship. A $1,000 scholarship awarded to a deserving student.

Deloitte & Touche Scholarship. A $1,000 graduate scholarship awarded to a deserving student.

Sylvan Erickson Graduate Scholarship. A $500 scholarship awarded to a graduate student in Business Administration based on academic achievement, integrity, and character.

Jones, Wright, Swenson & Simkins Scholarship. A $500 scholarship awarded to a student showing promise for success in the accounting profession.

Roland Monson Scholarship. A $1,000 graduate scholarship awarded to a student majoring in accounting.

Rudd & Company Scholarship. A $500 scholarship awarded to a student majoring in accounting.

Shell Oil Scholarship. A $2,000 award is provided to assist deserving students.

Grant Thornton Scholarship. A $1,000 scholarship awarded to a deserving student majoring in accounting.

College of Business students interested in scholarships need fill out only **one** application form to be considered for **all** business scholarships.

If you have questions about scholarships, contact the director of the College of Business Student Service Center (Business 306). Application forms are available from the College of Business Student Service Center.

College of Education

Scholarships

Applications for the following scholarships are available at the College of Education Dean's Office, Education 109.

Academic Olympiad Scholarships. Awarded to high school students who are winners of the scholastic competition at the annual USU Academic Olympiad sponsored by the Northern Utah Curriculum consortium and the College of Education chapter of Phi Delta Kappa. Information can be obtained from the Office of the Associate Dean for Continuing Education and Field Services, College of Education.

Oral L. and Tacy C. Ballam Scholarship. Established to assist outstanding career teachers as seniors complete their program of studies, with an effort to recognize minority, nontraditional, or disadvantaged populations.

Walter R. Borg Scholarship. Recipients, to be chosen by a scholarship selection committee of the Psychology Department, should demonstrate academic achievement, financial need, and personal integrity. Applicants must be students in the USU Psychology Department who have already completed at least one year of graduate study.

Edith Bowen Scholarship Fund. Variable $1,000 scholarships are awarded each year in memory of Miss Edith Bowen from an endowment established by her niece, Stella Young Griffiths. The awards are for junior, senior, or graduate students majoring in elementary education. Information and applications may be obtained from the Department of Elementary Education or the Student Services office.

Marie Eccles Caine Scholarship in Dance. Awards of $500-1,000 are made annually to dance majors and minors. Recipients should have attained a high scholarship standard, be a current major or minor in the dance program, demonstrate talent in dance performance, choreography, or teaching, and perform for the modern dance company, DANCEWORKS, for the academic school year. In addition, financial need and volunteer work for any dance program project may be considered by the selection committee. Contact head, Department of HPER.

The Joanne Lillywhite Christensen Endowment in Communicative Disorders. Mrs. Ray L. Lillywhite established this endowment in memory of her daughter, Joanne Lillywhite Christensen. Recipients of these awards, known as Lillywhite Scholars, are identified annually by the faculty of the Communicative Disorders and Deaf Education Department and represent academic distinction in either undergraduate or graduate education.

Dance Tuition Waivers. Full tuition waivers, covering 18 credits for three consecutive quarters, are available to dance majors and minors. Applicants must demonstrate commitment to the dance program and must have attained high scholarship standards. Demonstration of talent in the area of performance, choreography, or teaching, and commitment to performing with the modern dance company, DANCEWORKS, is also required. Providing the student maintains a 3.7 GPA, this scholarship is renewable upon reapplication every year. Contact head, Department of HPER.

Myrtle Sowards DeHart Scholarship in Elementary Education. In honor of Mrs. DeHart, this fund is for a student whose GPA is at least 3.4 and who wishes to become an elementary school teacher. Contact department for details.

Lois Downs Scholarship. All HPER majors are eligible for this award. The recipients of the Lois Downs Scholarship should have attained a high scholarship standard, maintain a high ethical standard, and be involved in department sponsored activities, College of Education, the University and campus, and community activities, and have a financial need. Selection of the recipient is made by the

departmental faculty upon recommendation of the scholarship and awards committee. Contact the HPER department head.

Eldon and Janice Drake Academic Scholarship for Juniors. Established by Eldon and Janice Drake, this scholarship is for a junior student majoring in Secondary Education who indicates potential for success as a teacher.

Eldon Drake Student Teaching Award. Awarded to a student majoring in Secondary Education whose exemplary performance in student teaching indicates a high potential for success in the teaching profession.

Mary Jane Faylor Scholarship for a Junior Woman in Health, Physical Education and Recreation. Junior women students in the department are eligible to apply for this scholarship, established in memory of her mother by Orpha Faylor Bradley. These recipients should have attained a high scholarship standard; maintain a high ethical standard; be involved in department sponsored activities, College of Education, University and campus, and community activities; and have a financial need. Selection of the recipient is made by the department head upon recommendation of the Scholarship and Awards Committee. Contact head, Department of HPER.

Orpha Faylor Scholarship in Dance. All Dance majors are eligible for this award. The recipients of the Orpha Faylor Scholarship in Dance should have attained a high scholarship standard, be current majors in the dance program, demonstrate talent in dance performance, choreography, or teaching, and agree to perform with DANCEWORKS for the academic year. In addition, the following may be considered by the committee when making selection: (1) financial need, (2) volunteer production, and (3) volunteer work for any dance program project. Contact head, Department of HPER.

Clifford and Julie Manning Frye Scholarship. Department of Elementary Education. Upper-division and graduate students are eligible for this scholarship. Contact head, Department of Elementary Education.

Matthew David Hillyard Endowment Scholarship Fund. Established by Mr. and Mrs. Lyle W. Hillyard in honor of their son, this scholarship is for students in the Special Education and Rehabilitation Department. Contact head, Department of Special Education and Rehabilitation.

H. B. and Ethel Hunsaker Scholarship. All HPER majors are eligible for this award. These recipients should have attained a high scholarship standard; maintain a high ethical standard; be involved in department sponsored activities, College of Education, University and campus, and community activities; and have a financial need. Selection of the recipient is made by departmental faculty upon recommendation of the Scholarship and Awards Committee. Contact head, Department of HPER.

Arthur D. Jackson Scholarship in Elementary Education. Awards are made annually to senior or graduate students majoring in elementary education. Information and applications may be obtained from the Department of Elementary Education.

Donald F. Kline Scholarship Endowment Fund. Established by family and friends in memory of Donald F. Kline. This scholarship is for an upper-division or graduate student in the Department of Special Education and Rehabilitation who demonstrates superior academic achievement and has financial need.

Ina W. Kurzhals Scholarship. Department of Elementary Education. Upper-division and graduate students are eligible for this scholarship. Contact head, Department of Elementary Education.

Ty and Bernice McCowin Scholarship. Awarded to a junior or senior student certifying in Secondary Education and having a major or minor in English, math, science, or social studies. Preference will be given to students who will be teaching in the field of math or science. Contact head, Department of Secondary Education.

Joseph Steven Meyrick Memorial Scholarship. Established by Mr. and Mrs. Stanley Meyrick in honor of their son, this scholarship is for a special education major who has a disability or someone with a disability in his or her family. Contact head, Department of Special Education and Rehabilitation, for additional criteria.

Dean LeGrande Miller Scholarship in Communicative Disorders. Awards are made annually to senior or graduate students majoring in communicative disorders, who have demonstrated academic excellence despite personal hardships or handicaps. Selection of recipients is made by the departmental faculty, upon recommendation of departmental faculty committees.

Marie Shoup Scholarship. Upper-division and graduate students are eligible for this $500 scholarship. Awards are made on a three-year rotation to senior or graduate students having majors in the departments of Elementary Education, Family and Human Development, and Human Environments. Information and applications may be obtained from these three departments.

Chloe Priday Steward Memorial Fund. Given by Dean and Mrs. L. Mark Neuberger to students in elementary education in memory of their aunt, Mrs. Steward. Contact the Department of Elementary Education.

Special Education Personnel Preparation Support Scholarships. All students majoring in special education may apply for these scholarships, which are funded by federal grants to the Department of Special Education and Rehabilitation. Amount of awards varies. Contact head, Department of Special Education and Rehabilitation.

Student Travel Scholarship in Psychology. For psychology students whose papers are accepted by the American Psychological Association to use as partial or full travel expenses to the annual meetings. Contact head, Department of Psychology.

Thomas Alva Taylor Scholarship. Established by Edna Cardon Taylor in memory of her husband, Thomas Alva Taylor. Recipients shall be known as Taylor Scholars and shall be outstanding male senior or graduate students majoring in Elementary Education at USU.

Lucile Kunz Yerger Scholarship. Established by the family of Lucile Kunz Yerger. Awarded to a student studying speech-language pathology who has demonstrated outstanding clinical performance in professional preparation. Contact head, Department of Communicative Disorders and Deaf Education.

Adele C. Young Scholarship. Established by Dale W. and Adele C. Young in honor of Mrs. Young, who was an elementary education teacher in Utah, Texas, Iowa, New Jersey, and New York. Junior or senior students who demonstrate academic achievement, financial need, and personal integrity are eligible to apply.

College of Engineering

Scholarships

Most of these scholarships are reserved for juniors and seniors in the College of Engineering. Freshmen will only be considered if they take the Engineering Scholarship Exam, which is offered annually in conjunction with the University Scholars Competition. Applications for the following scholarships are available at the College of Engineering Dean's Office, Engineering Classroom 110.

Baker/Hughes Engineering Scholarship. A tuition scholarship to be awarded annually to an instate student enrolled in the Mechanical and Aerospace Engineering Department.

Jay R. Bingham Scholarships. Awarded to students majoring in Civil Engineering. Amounts vary each year.

A. Alvin and Anna Beth Reeder Bishop Biological and Irrigation Engineering Scholarship. Awarded to junior, senior, and graduate students in Biological and Irrigation Engineering.

James E. Brown Scholarship in Space Sciences, Space Engineering, and Aerospace Corporation Administration. Awarded to undergraduate students in some aspect of space sciences, space engineering, and aerospace corporation administration. The colleges of Business, Engineering, and Science take turns awarding this scholarship each year.

Bourns Scholarship. Awarded annually to two juniors or seniors in Electrical and Computer or Mechanical and Aerospace Engineering. Recipients must be U.S. citizens and residents of Utah. Amounts vary.

Roy Bullen Memorial Fund for Engineering Students. Approximately $1,000 to be available annually to aid undergraduate engineering students. Established by the late Mrs. Bullen in honor of her husband after whom the fund is named.

Michael B. Bylund Scholarship in Electrical Engineering. Awarded to undergraduate electrical engineering students in their junior or senior year.

CEE Faculty Scholarships. Department of Civil and Environmental Engineering. Available to students entering their junior or senior year. Amounts vary from year to year.

Jerry Christiansen Memorial Engineering Scholarship. Established by Prof. and Mrs. Jerald E. Christiansen in memory of his father, this fund is for students enrolled in the College of Engineering.

Dr. and Mrs. Clayton Clark Engineering Scholarship. Annual grant to support needy students in electrical engineering. Amount varies.

Blaine P. and Louise Christiansen Clyde Engineering Scholarship Fund. The Clydes, alumni of USU, have established these scholarships for students majoring in engineering who have financial need.

W.W. Clyde and Company Engineering Scholarship Fund. Scholarships for undergraduate students majoring in engineering.

Larry S. Cole Electrical Engineering Scholarship. To be used for students in the electrical engineering professional program.

The Philip S. Coolidge Memorial Scholarship. An endowment from the Department of Biological and Irrigation Engineering that gives a two-year upper-division scholarship to students in the field. GPA must be at least 3.25. Contact department head for details. Established in memory of USU student Philip S. Coolidge.

Don M. Corbett Scholarships. Awarded to entering freshman women students in engineering by Mr. and Mrs. Corbett to encourage women in this field. About 25 scholarships annually.

William A. Cordon Scholarship. Department of Civil and Environmental Engineering. A scholarship for a graduate student to research concrete materials.

Lehi Davis Scholarship. For undergraduates enrolled in the Department of Civil and Environmental Engineering whose studies emphasize building structures.

Bertis L. and Anna E. Embry Scholarship. To be used for students in biological and irrigation engineering and electrical and computer engineering.

Mark K. Fjeldsted Scholarship in Civil and Environmental Engineering. A $1,000 scholarship given annually. Recipients must be U.S. citizens.

Forsgren Associates Scholarship in Civil and Environmental Engineering. Awarded annually to an outstanding student enrolled or to be enrolled at USU.

Parker Hannifin Corporation Scholarship. Awarded to a student majoring in mechanical engineering.

Dee and Linda Hansen Scholarship in Civil and Environmental Engineering. For juniors and seniors with a major in the Department of Civil and Environmental Engineering.

Industrial Technology Scholarships. Several $500 scholarships given annually to students in engineering technology.

LeGrand Johnson Memorial Scholarship. Department of Civil and Environmental Engineering. Available to students entering their junior or senior year. Amounts vary from year to year.

Max LeGrand Johnson Memorial Engineering Scholarships. One or two scholarships awarded annually to students majoring in civil engineering.

Frank Kelsey Memorial Aviation Scholarship in the Department of Industrial Technology and Education. Awarded to an undergraduate or graduate student enrolled in the Flight Training Program.

Kennecott Corporation Scholarships. Awarded to students in civil engineering, environmental engineering, or industrial hygiene.

William H. Kibbie Aviation Scholarship. Awarded to students in the flight technology program with demonstrated need and significant progress in the program.

George A. and Ivalou Keller Lawrence Scholarships in Civil and Environmental Engineering. Awarded annually on the basis of academic performance and financial need.

Lockheed Leadership Scholarship. Lockheed Martin Idaho and the Idaho National Engineering Laboratory support engineering scholarships for minority students in engineering.

Mechanical Engineering Alumni and Faculty Scholarship. Student must have a high GPA and be pursuing a degree in mechanical engineering.

E. Joe Middlebrooks Scholarship. An annual scholarship for a woman or minority engineering student.

David R. Miller Memorial Scholarship in Civil and Environmental Engineering. One or more full tuition and fees scholarships given annually to undergraduate or graduate students. Preference will be given to those with financial need.

Nielsen, Maxwell, Wangsgard Scholarship. Awarded annually to a student in the Civil and Environmental Engineering Department. Student must be interested in consulting engineering.

Henry J. and Rebecca Henderson Nelson Memorial Scholarship in Engineering. Established by Prof. and Mrs. Jerald E. Christiansen in memory of her parents, this endowment is for students enrolled in the College of Engineering.

Jack B. and Bonnie F. Parson Scholarships in Engineering. Grants awarded to students of at least sophomore status, who show superior scholarship ability, a commitment to high social and moral values, and financial need.

Dean F. and Bessie C. Peterson Scholarship in Engineering. Available to students in the College of Engineering.

Harold and Else Peterson Scholarships. Awarded annually on the basis of academic performance and financial need.

Questar Corporation Scholarship. Awarded to an engineering student with financial need.

Ace and Arville Raymond Scholarship in Engineering. Awarded annually to an outstanding and worthy undergraduate in the College of Engineering.

Carlyle and Elliot Rich Scholarship. Awarded to students majoring in the Department of Civil and Environmental Engineering on the basis of academic achievement, superior potential, and personal integrity.

Charles Carlyle Rich Engineering Scholarship. Established in Mr. Rich's memory for students enrolled in civil engineering.

Lowell R. Rich and Afton T. Rich Scholarship in Civil and Environmental Engineering. Awarded to undergraduate students. Amount varies.

Harold W. and Helen Ritchey Engineering Scholarship. A $5,000 scholarship granted to an incoming freshman student for four years of study.

Larry E. Roberts Scholarship in Electrical Engineering. One or more scholarships representing full tuition and fees for one year for undergraduate or graduate students.

Peggy R. Roskelley Memorial Scholarship for Women. For a female engineering student with financial need. Awarded to juniors and seniors.

SME Scholarship. Student must have a high GPA and be pursuing a degree in mechanical engineering with a manufacturing option.

Carl and Nadeane Spear Scholarship. Awarded to a junior or senior student majoring in either Mechanical or Manufacturing Engineering.

Sidney R. Stock Scholarship in Electrical Engineering. Given in memory of the founder of the department, this scholarship is for students majoring in electrical engineering.

Ivan M. and Ruth C. Teuscher Memorial Scholarship. Tuition scholarships for students in the College of Engineering.

Charles Thirkell and Pearl Parkinson Darley Scholarship. Awarded to continuing students or transfer students in civil engineering. Amounts vary.

Edwin P. Van Leuven Scholarship. Awarded to students who will be teaching in the fields of industrial and technical education. Given by Mr. and Mrs. Van Leuven, leaders in this subject.

Woodward-Clyde Engineering Scholarship. For undergraduate students in the Civil and Environmental Engineering Department.

College of Family Life

Scholarships

Applications for the following scholarships are available at the College of Family Life Dean's Office, Family Life 205.

Margaret F. Anderson (Class of 1952) Endowment. Established by DeLonne Anderson and Margaret F. Anderson. Recipients should demonstrate financial need, personal integrity, and average academic achievement. Scholarship recipients may receive this scholarship for more than one year.

Flora Howard Bardwell (Class of 1964) Endowment. Established by friends and family of Flora H. Bardwell. Recipients should demonstrate academic achievement, financial need, and personal integrity.

Anna Beth Reeder Bishop (Class of 1938) and A. Alvin Bishop Endowment. Awarded to a junior or senior student with a record of excellence in scholarship, with preference to be given to a U.S. citizen and a member of Phi Upsilon Omicron.

Clara L. Budge (Class of 1930) Endowment. A scholarship established in memory of Mrs. Budge by her husband and son. This scholarship is for undergraduate or graduate students who show personal integrity, superior potential, and academic achievement.

Joan F. Budge Endowment. Established in memory of Joan Budge by her husband, children, and friends. Awarded to an undergraduate student in any discipline.

Annie (Nan) Nibley Bullen Endowment. A scholarship presented to a student who demonstrates financial need and personal integrity.

Ellen Kathleen Powell Burton (Class of 1925) Endowment. Awarded in memory of Mrs. Burton by her daughter, Janice, to an undergraduate with a record of scholarship and achievement. Preference given to a student majoring in Family and Consumer Sciences Education.

Dr. Don C. Carter Graduate Fellowship. A memorial for former USU College of Family Life Professor Carter. This award is for graduate students majoring in family and human development. Contact department for details.

College of Family Life Endowment. Scholarships provided by contributions given by alumnae, alumni, and friends of the College of Family Life to worthy students who show outstanding promise.

Susie Sanford Cook (Class of 1927) Endowment. A scholarship presented to junior or senior women who show academic achievement and financial need.

Ruth Swenson Eyre (Class of 1951) Early Childhood Education Endowment. Presented each year to an undergraduate student majoring in Early Childhood Education and with special interest in Alternative Preschool and Day-care Curricula which emphasize and enhance the emotional and social growth of children. The scholarship was established by Mrs. Eyre's sons.

Mary Jane Faylor Endowment. Junior women students in the College of Family Life are eligible to apply for this scholarship established by Thelma Faylor Allison (class of 1927) in memory of her mother.

Orpha Faylor Endowment. A scholarship awarded by Thelma Faylor Allison, in memory of her sister, to outstanding junior or senior women majoring in Interior Design.

Coy Fife (Class of 1929) Endowment. Coy Fife established this scholarship endowment to assist needy and deserving direct descendants of her brother and two sisters in their educational endeavors in any discipline at USU. Applicants must demonstrate financial need, personal integrity, and scholastic potential, as attested to by three letters of recommendation from reputable sources. If no Fife family members apply, the scholarship will be made available to eligible students in the College of Family Life.

Carrie Johnson Fullen (Class of 1985) Scholarship. A scholarship established by Mrs. Jane Shoup Johnson to honor her daughter, a recent graduate of the College of Family Life.

Grace Williams Funk and Dr. Kaye Funk (Class of 1946) Endowment. A scholarship to a Utah resident senior or graduate student in the field of clothing and textiles or food service management.

Dr. Niranjan R. Gandhi (Class of 1970) and Josephine N. Gandhi Endowment. Awarded to outstanding undergraduate and graduate students with majors in the Department of Nutrition and Food Sciences.

Greaves Memorial Endowment. A scholarship in memory of Dr. Ethelyn O. Greaves, former dean of the college, for a student who has achieved in a field in the college.

Stella Young Griffiths (Class of 1919) Endowment. Established by Mrs. Griffiths for an outstanding undergraduate student.

Barbara Fitzgerald Hulme (Class of 1944) and David K. Hulme Endowment. Recipients should demonstrate academic achievement and financial need.

Maurine Robson Humphris (Class of 1947) Endowment. A scholarship awarded to a junior or senior student with a record of excellence in scholarship who is majoring in Family and Consumer Sciences Education.

Theta Johnson (Class of 1938) Endowment. The recipient is to be an outstanding senior or graduate student whose area of study is either clothing and textiles or Family and Consumer Sciences Education, with preference for an individual with 4-H experience.

Katie Karikka (Class of 1938) Endowment. For high school seniors who will enter the College of Family Life majoring in Family and Consumer Sciences Education at USU.

Maurine Flint Keller (Class of 1932) Memorial Endowment. A scholarship established in memory of his wife by Paul D. Keller for an outstanding student in Human Environments.

Dr. H. Alan Luke and Mrs. Janet Marchant Luke (Class of 1956) Endowment. Available to students who are majoring in Family and Consumer Sciences Education or in the departments of Family and Human Development or Nutrition and Food Sciences. The students must demonstrate academic achievement, personal integrity, and financial need, with first preference given to direct descendants of Albert Harper Marchant or John Henry Luke. Upper-class students in need of financial assistance shall receive preference.

Eliza B. Mackay Endowment in Family and Consumer Sciences Education. Established by Reed B. Mackay in memory of his mother, Eliza B. Mackay. The student recipient should demonstrate academic achievement, financial need, and personal integrity.

Dr. Arthur W. Mahoney Endowment in Nutrition and Food Sciences. A memorial scholarship established by Sylvia M. Mahoney, family, and friends. Recipients must be students with a major in the Department of Nutrition and Food Sciences who demonstrate academic achievement and financial need.

Arola B. McDonald (Class of 1937) Dietetics Endowment. A scholarship presented to an undergraduate dietetics student. Provided by Mr. and Mrs. Leonard W. McDonald.

Charles N. and Dr. Margaret B. Merkley (Class of 1952) Endowment. Student recipients should demonstrate academic acheivement, financial need, and personal integrity. Students must be committed to a career in one of the fields encompassed by the course of study in the College of Family Life. Recipients must be upper-class or graduate students. The endowment is not renewable.

Moen Memorial Endowment. A scholarship in memory of Johanna Moen given to worthy students in the College of Family Life who show outstanding aptitude in the field.

Dr. Eldrow (Dutch) and Marjorie Seely Reeve (Class of 1940) Endowment. A scholarship for graduate and undergraduate students that show academic achievement, personal integrity, and superior potential.

Ritewood Inc. Endowment. Provides scholarships to a nutrition student and a food science student in the Department of Nutrition and Food Sciences.

Seely-Hinckley Endowment. A scholarship for a student of superior attainment and demonstrated need who has a clearly defined academic program leading toward post-graduate work in food sciences and nutrition.

Marie Stowell Shoup Memorial Endowment. A scholarship established in memory of Mrs. Shoup by her husband and daughters for an upper-division woman student in Human Environments, based on scholarship and need.

Dr. Phyllis R. Snow Graduate Endowment. Established in honor of Phyllis R. Snow, former dean of the College of Family Life. This scholarship is given to a graduate student of high academic standing and potential.

Ila Smith Taggart (Class of 1936) Endowment. Student recipients should demonstrate academic achievement and financial need.

Frances G. Taylor (Class of 1941) Phi Upsilon Omicron Endowment. Awarded to a U.S. citizen who is an active member of Kappa Chapter.

Gregory Carl Trevers (Class of 1972) Memorial Endowment. A scholarship for undergraduate and graduate students in Family and Human Development established by Cherie and Mercer Trevers and Loretta Trevers.

Dr. Harris O. and Eleanor Y. Van Orden Endowment. A scholarship for an undergraduate nutrition and food sciences major with high academic record.

Angelyn Wadley Endowment. A scholarship to an outstanding student in the College of Family Life provided by the Wadley family and friends in memory of Angelyn Wadley.

Dorothy B. Wanlass Endowment. Interest may be used for undergraduate and graduate student scholarships in the College of Family Life.

Leah D. Widtsoe Graduate Endowment. Presented to a graduate student in the College of Family Life. The fund was established by Dr. Virginia Cutler in memory of Mrs. Widtsoe.

Dr. Ethelwyn B. Wilcox Endowment. Awarded to worthy students majoring in human nutrition at the graduate or undergraduate level.

Dr. Dale W. and Adele Christensen Young (Class of 1942) Endowment. A scholarship for graduate and undergraduate students who show academic achievement, personal integrity, and superior potential.

College of Humanities, Arts and Social Sciences
Scholarships

Applications for the following scholarships are available at the College of HASS Dean's Office, Main 131.

The Ahmanson Art Education Scholarship. Awarded annually to outstanding Art Education majors in their junior or senior year. Contact Department of Art for details.

Wendell B. Anderson Scholarship. In honor of Dr. Anderson, political science professor, this scholarship is given to an outstanding political science major who is also an athlete. Awarded on the basis of GPA and a commitment to succeed in political science. For details, contact the Department of Political Science.

J. Duncan Brite Scholarship. In honor of Professor Emeritus Brite, this scholarship is given to an outstanding junior in history for use during the senior year. Contact History Department for details.

Asa and Vivian Bullen Prelaw Scholarship. Donated in memory of his parents by Richard H. Bullen, this endowment provides resident tuition scholarships for two outstanding prelaw students, senior year only. For details, contact the Political Science Department.

Helen Bullen Music Scholarship. Awarded to a deserving music student on the basis of financial need. For details, contact the Music Department.

Cynthia Farr Bylund Scholarship. This endowment, established by Cynthia Farr Bylund, a 1978 Political Science graduate, honors a junior or senior in Political Science who demonstrates superior potential in the field, personal integrity, and high social and ethical responsibility. GPA is not the main criteria for selection. For details, contact the Department of Political Science.

The George B. and Marie Eccles Caine Scholarship in Music, Art, and Theatre. These scholarships are given in each of the three departments named to students attending USU. Contact one of the departments above for details.

O. Guy Cardon and M.N. Neuberger Scholarship in Social Science. The Bluebird Candy Company at Logan offers a scholarship in the social sciences, in honor of the late O. Guy Cardon and of the late M. N. Neuberger. Students are nominated by the Social Science departments for this award. (Applications not accepted.)

Mabel Carlson English Scholarship. Awarded to English majors for junior or senior year study. Contact the English Department for details.

Louise Christiansen Clyde English Scholarship Fund. This endowment, established in honor of Mrs. Clyde, a 1941 USU graduate in English, is for undergraduate students majoring in English. Contact English Department for details.

David E. and Leona E. Daley Theatre Arts Scholarship. This memorial scholarship was established by the late Mrs. Daley for undergraduate or graduate students majoring in theatre arts, who have financial need. Contact the department for details.

Carl T. Degener Scholarship. Prof. Degener left a bequest for deserving juniors who are majoring in languages at Utah State University. Contact Department of Languages and Philosophy for details and application.

***Deseret News* Professional Internship in Journalism.** The *Deseret News* offers the outstanding junior student in journalism a scholarship for $150 and employment with the *News*, either at Salt Lake City or at one of its bureaus, during the summer between the junior and senior years. The winner is selected by judges representing USU and the *News*. Contact Department of Communication for details.

Ellen Stoddard Eccles Scholarship. An endowment given by Noni Eccles Harrison in memory of her late mother, after whom the fund is named. This scholarship is open to junior, senior, or graduate ceramic majors. For details, contact the Art Department.

Frank Blair and Minnie Fisher Ellsworth Music Scholarship. Awarded to a music student on the basis of academic achievement, financial need, and personal integrity. For details, contact the Music Department.

English Department Memorial Scholarship. An annual scholarship is given in memory of King Hendricks and John Samuel Bullen. Contact English Department for details.

J.C. Fonnesbeck Scholarship in English. Students majoring in English with financial need and high academic standing may apply for this scholarship, established in memory of her father by Alice Fonnesbeck Gardner. Contact Department of English for details.

Earl A. and Carmen D. Fredrickson Fellowship in Sociology. Limited to first-year graduate students in sociology. Earnings from an endowment fund of $10,000 established in 1974 provide a fellowship award once every two or three years. The fellowship award will amount to about $2,000 for the academic year. The Sociology, Social Work and Anthropology Department supervises the funds and selects the fellowship recipient from among the first-year sociology graduate students.

The Joseph A. and Grace W. Geddes Research Scholarship. For full-time graduate students majoring in sociology to use for research. Contact department chairman for details.

Jay W. Glasmann Family Scholarship. Scholarships endowed by the Glasmanns, a Utah pioneer family who founded the *Ogden Standard Examiner,* for journalism students. Preference is given to students from Weber, Box Elder, Morgan, and Davis Counties in Utah. Administered by the Department of Communication. Check with department for application details.

LuAnn M. Hamilton Memorial Scholarship. Established by family and friends in memory of Miss Hamilton, a baccalaureate graduate of the USU Social Work Program. Earnings from the fund are awarded to a junior or first quarter senior social work student, on the basis of scholarship, initiative, character, and professional promise. Contact Social Work faculty for details.

Nora Eccles Harrison Graduate Fellowship. A grant to a graduate student in ceramics selected by the head of the ceramics program to further study in ceramics from a generous endowment given by Mrs. Harrison. Contact Department of Art for details.

Peter O. Holmgren Scholarship. Awarded annually only to students in the humanities division of HASS. Application forms must be obtained from the dean's office of the College of Humanities, Arts and Social Sciences, Main 131. Applications and supporting materials must be turned in to the HASS dean's office on or before April 1.

ICMA Scholarship in Newspaper Management. A scholarship offered by the International Circulation Manager's Association, the Newspaper Center, Reston, Virginia. First preference is given to juniors and seniors with an interest in newspaper

circulation management. Two awards annually. Administered by the Department of Communication. Check with department for application details.

Jean Inness Scholarship Endowment in French. This scholarship is for an upper-division or graduate student attending USU who has maintained at least a 3.0 GPA during the preceding academic year. Although the primary interest is French, Spanish may be substituted if there is no acceptable candidate. Contact Department of Languages and Philosophy, Main 204, for application and details.

David L. Jensen Scholarship. This endowed scholarship is awarded yearly to either an undergraduate or graduate student in the Department of Landscape Architecture and Environmental Planning. Contact LAEP Department for details.

Carolyn Tueller Lewis Memorial Vocal Scholarship. Awarded to outstanding voice students. For details, contact the Music Department.

Glacus G. and Marie B. Merrill Scholarship Endowment. A scholarship endowed by Utah radio pioneer Glacus Merrill for seniors in journalism. First preference is given to those with broadcast emphasis and interest in radio. Administered by the Department of Communication. Check with department for application details.

Floyd T. Morgan Endowment Fund. In honor of the former Theatre Arts Department head, this scholarship is awarded to an upper-division or graduate theatre arts major. Contact Department of Theatre Arts for details.

Laval S. and Rachel B. Morris Traveling Fellowship for Students in Landscape Architecture and Environmental Planning. Prof. Morris, who established the LAEP Department at USU, and his family have endowed this fund for LAEP students' educational travel outside of North America. Contact Department of LAEP for details.

Music Department Scholarships. The USU Music Department gives scholarships to incoming students and those currently enrolled in the areas of orchestra, band, vocal, piano, and organ. Contact Music Department for details.

Preston Nibley History Scholarship. A full tuition scholarship for one year to be awarded to an outstanding history student. Contact History Department for details.

N. A. Pedersen Scholarship in English. Undergraduate students majoring in English, who have high academic standing and financial need, may apply for this scholarship given in the memory of Dr. N. A. Pedersen, former department chairman and dean at USU. Contact Department of English for details.

George Phatz Memorial Scholarships. Symphony orchestra scholarships. Contact Department of Music for details.

Presser Scholarship. A full tuition scholarship for one year to be awarded to an outstanding music major currently in his/her junior year. Contact the Music Department for details.

Lucile C. Reading Scholarship for Students of Children's Literature. A bequest from Mrs. Reading, who wrote and edited children's literature, for English majors at USU who plan to teach, study, or write for children. Contact English Department for details.

Walter Siegenthaler Scholarship. A scholarship endowed by the Media Law firm of King & Ballow, Nashville, Tennessee for juniors, seniors, or first-year graduate students. First preference is given to students with an emphasis in newspaper management in circulation. Two awards annually. Administered by the Department of Communication. Check with department for application details.

Ralph Jennings Smith Creative Writing Scholarship. An award consisting of one quarter's tuition and fees is presented to an undergraduate or graduate student who is a serious creative writer. Recipient is selected based on a creative writing contest. Contact English Department for details.

Social Work Scholarships. Earnings from an endowment fund established in 1937 provide an annual scholarship award for a student majoring in social work. Junior and senior women in social work are eligible for consideration. The amount of the grant varies from $100 to $200 per student. Contact Department of Sociology, Social Work and Anthropology for details.

Teaching Assistant. Department of Communication; $4,000 with tuition waivers available; graduate student only. Apply through Department of Communication.

Gwendella Thornley Memorial Scholarship. Awarded to students who are in their junior year and who are majoring in oral interpretation. Contact Department of Theatre Arts for details.

W. Mont Timmins Essay on the Pioneering of Cache Valley. A cash prize is awarded by the Timmins family for the best essay on an aspect of pioneering in this valley, from earliest recorded times to present. Open to all undergraduates and graduates. Details from USU History Department.

Utah Headliners Scholarship. A scholarship awarded annually by the Utah Headliners Chapter of the Society of Professional Journalists. It is open to all junior students who are pursuing careers in journalism. Administered by the Department of Communication. Check with department for application details.

Utah Press Association Scholarship in Community Journalism. Offered annually to juniors and seniors with a major interest in community print journalism. Administered by the Department of Communication. Check with department for application details.

Utah State Theatre Talent Awards. Several awards of $200 to $400 are given each year to outstanding students entering or already enrolled as theatre arts majors. Applicants must audition and be interviewed. Contact Theatre Arts Department for details.

Angelyn W. Wadley Memorial Scholarship. Awarded in memory of Mrs. Wadley to students in history. Contact History Department for details.

Josey Barnes Wayman Theatre Arts Scholarship. A scholarship endowed by USU alumna Josey Barnes Wayman to be awarded to outstanding junior or senior female students majoring in theatre who demonstrate high academic standing and financial need. For details, contact Department of Theatre Arts.

John S. and Unita Welch Prelaw Scholarship. Provides resident tuition scholarships, senior year only, for outstanding students who intend to pursue law as a profession. For details, contact Department of Political Science.

Esther V. Erickson Wrigley Scholarship. The Robert L. Wrigley family presents two scholarships annually to English majors in memory of Mrs. Wrigley. Scholarships are given to outstanding students of sophomore and junior standing. Contact Department of English for details.

College of Natural Resources

Scholarships

Note: Separate application must be made through the College of Natural Resources; check with the dean's office, Natural Resources 112, for application forms and deadlines.

College of Natural Resources Alumni Association Scholarship. Awarded on the basis of financial need to a student with a major in the College of Natural Resources. Special consideration given to nontraditional students.

Joseph Barry Bass Memorial Scholarship. Awarded to an outstanding freshman or sophomore majoring in range science who meets as many of the following criteria as possible: graduated from a high school outside of Utah, active in the USU student chapter of the Society for Range Management, served as a range management employee with a federal land management agency or worked for the federal government in fire control, active in the USU Rodeo Club, a member of Alpha Gamma Rho, and served in the military.

Ray Becraft Scholarship. Awarded to a freshman on the basis of scholarship, need, leadership, and interest in natural resources.

Mark R. Boyer Scholarship. Recipient must be a junior or senior majoring in fisheries and wildlife. The student must demonstrate financial need, personal integrity, and a high sense of social and moral responsibility.

T. W. Box Scholarship. Recipient must be a natural resources student who demonstrates financial need, has potential for excellence, and maintains a 3.25 GPA while receiving the scholarship.

Class of '50 Scholarship. This endowment fund was created and is maintained by contributions from the College of Natural Resources graduating class of 1950. Recipient must enroll for at least 12 credit hours each quarter and earn a 3.0 cumulative GPA. Student must demonstrate need of scholarship.

T. W. Daniel Scholarship. Awarded to the outstanding junior student in the forestry major as determined by scholastic excellence and contribution to the Forestry Club.

Paul M. and Neva Dunn Scholarship. Recipient must be at the end of his/her junior year in the College of Natural Resources. Award will be based on scholarship and need.

Fisheries and Wildlife Faculty and Emeritus Faculty Scholarships. Recipient must be a junior or senior registered in Fisheries and Wildlife. Selection will be based on academic performance, ethical and moral standing, and financial need.

J. Whitney Floyd Memorial Scholarship. Recipient must be registered in the Forest Resources Department as a junior or senior. Selection will be based on academic performance, as well as ethical and moral standing. Student should show some evidence of financial need.

Geography Faculty Scholarships for Academic Excellence. Awarded to an outstanding sophomore, junior, and senior in the Geography and Earth Resources Department.

George E. Hart Scholarship. Recipient should demonstrate academic achievement, personal integrity, and a high sense of social responsibility.

Arthur F. Johnson Scholarship. Awarded annually to a qualifying junior for completion of his/her degree in fisheries and wildlife management. Candidates must have a career interest in the field of fisheries and wildlife and shall present a record of related accomplishments and potential in high school, college, or in field experience. Candidates with the greatest financial need will be given priority. Repayment may be made back into the endowment, but it is not required.

Samuel E. Jorgensen Scholarship. Awarded to a student majoring in fisheries and wildlife.

George A. Judah Scholarship. Determined on the basis of GPA, Society for Range Management activities, demonstrated leadership, and potential to contribute to the range management profession.

George H. and Dorothy Kelker Scholarship. Awarded to a junior or senior natural resources student on the basis of professional promise, academic achievement, and commitment to ethical management of natural resources.

William G. Kohner Scholarship. Awarded on the basis of financial need and academic achievement.

Timothy Leary Scholarship. Awarded to a junior student majoring in environmental studies who exhibits a genuine concern for and dedication to natural resources conservation and the environment.

John and Karen Malechek Scholarship. Awarded to a range science student on the basis of academic achievement and financial need.

Mutual of Omaha Marlin Perkins Scholarship. Awarded to a junior or senior with an interest in wildlife conservation, natural resources management, or environmental education. Selection is based on academic achievement and extracurricular activities demonstrating an interest in these natural resources fields.

Phelps/Ware Scholarship Award. Awarded to a student in the Fisheries and Wildlife Department who has demonstrated a commitment to the hunting and fishing aspects of resource management.

S. J. and Jessie E. Quinney Scholarship. Student must be a high school or transfer student seeking either a first or second bachelor's degree or a Master of Forestry degree. Awarded to students showing high academic performance, leadership, and evidence of promise. Student must be able to communicate effectively and show motivation in some aspect of natural resources. This will be determined by a written essay, personal interview, and references.

Gregory R. Rost Scholarship. Awarded on the basis of academic achievement, financial need, and personal integrity. Consideration is given to out-of-state students.

Richard M. Schreyer Scholarship. Awarded to a recreation resource management major who demonstrates academic achievement, financial need, and personal integrity.

Seely-Hinckley Scholarship. Awarded on the basis of academic achievement and financial need. Established as a memorial for John H. Seely and Robert H. Hinckley.

Arthur D. Smith Memorial Scholarship. Awarded to a student in the Rangeland Resources Department on the basis of academic achievement and financial need. Preference is given to a freshman or sophomore who comes from a rural area within the Intermountain region and who is interested in the land management aspect of range science.

Gary Smith Scholarship. Awarded on the basis of academic scholarship to a student who has the potential to become a "righter of wrongs and a singer of songs."

Society for Range Management—Laurence A. Stoddart Memorial Scholarship. Awarded by the Utah Section, Society for Range Management, to the outstanding range science sophomore or junior at Utah State University, Brigham Young University, or Southern Utah University. Selection is based on GPA, Society for Range Management activities, demonstrated leadership, and potential to contribute to the range management profession.

Laurence A. Stoddart Memorial Scholarship. Recipient must be a sophomore or junior student in the Rangeland Resources Department. Scholarship is awarded on the basis of GPA, Society for Range Management activities, demonstrated leadership, and potential to contribute to the range management profession.

Allen W. and Alice Stokes Scholarship. This scholarship is based on need, with special consideration given to nontraditional or ethnic minority students.

Victor N. and Beatrice E. Stokes Scholarship. Awarded on the basis of financial need to a forestry or range science major who has a demonstrated interest in land management of range and/or forest resources.

Jeffrey S. Workman Memorial Scholarship. Awarded to a USU undergraduate student in any major on the basis of need and the potential for the award to positively influence the recipient's personal and professional development. Scholarship is to be applied toward FAA-approved private pilot flying lessons.

College of Science

Scholarships

Applications for the following scholarships are available at the College of Science Dean's Office, Science Engineering Research 101.

John M. Branch Scholarship. A scholarship in memory of John M. Branch (BS Geology 1981). Awarded every other year to an outstanding undergraduate geology major.

James E. Brown Scholarship. A scholarship in space sciences, space engineering, and aerospace corporation administration to be awarded to a graduate or undergraduate student with high academic standards majoring in some aspect of space sciences, space engineering, or aerospace administration.

Theodore M. Burton Scholarship. Established by the LDS Church to honor Theodore M. Burton, who was a professor of chemistry at USU and a member of the First Quorum of the Seventy. Awarded annually to an outstanding sophomore, junior, or senior with a major in the College of HASS.

Chemistry and Biochemistry Alumni Award. A $100 scholarship award, provided by alumni funds, for an outstanding graduate student majoring in chemistry.

Christenson Memorial Scholarship. One quarter full-tuition scholarship, for support of undergraduate study in biology, available to senior students in zoology or entomology. The award is based upon scholarship, character, and professional promise. The funds from which the award is made were contributed by the family and friends of L. D. Christenson; the fund is administered by the Department of Biology.

College of Science Scholarship. A four-year tuition plus cash award given to an incoming freshman. Selection is made on the basis of performance on a competitive examination.

Oscar Wood Cooley Scholarship. A scholarship awarded to an outstanding junior or senior majoring in the college. This scholarship is given to honor the memory of Oscar Wood Cooley.

Get Away Special (GAS) Scholarship. High school seniors with an interest in space research are eligible to apply for a GAS scholarship. The scholarship is a full in-state tuition waiver and, provided the student's USU GPA remains at or above 3.5, is good for 12 academic quarters. Under certain conditions, the scholarship can be a full out-of-state tuition waiver. Through this scholarship program, the student is provided with the facilities and resources to build his or her own experiment for flight on the NASA Space Shuttle. Information can be obtained from the GAS Program Faculty Adviser, Physics Department, USU, Logan, UT 84322-4415.

Greaves Memorial Scholarship. Cash award in memory of Drs. Joseph and Ethelyn O. Greaves for students who have achieved in the field of science.

Delbert A. Greenwood Memorial Award in Biochemistry. A $100 scholarship award, given in memory of Delbert A. Greenwood, for an outstanding graduate student majoring in biochemistry.

Datus M. Hammond Memorial Scholarship. One full-tuition quarter scholarship in memory of late department head Datus M. Hammond for students in biology. Based upon scholarship, character, and professional promise, the award is generally made to a graduate student in biology.

Clyde T. Hardy Scholarship. A scholarship in honor of Clyde T. Hardy, professor emeritus and second Geology department head. Awarded every other year to an outstanding undergraduate Geology major.

Neville C. and Annie P. Hunsaker Scholarship in Mathematics. Scholarships for high school seniors going to USU and majoring in mathematics or for USU students enrolled in the Department of Mathematics and Statistics. This scholarship covers full tuition plus some expenses.

Garth L. Lee Undergraduate Scholarship Award. Four awards are given annually in honor of Garth L. Lee, former professor of chemistry at Utah State University, to a student in each year of study who demonstrates outstanding command of chemical science. The award consists of a $300 account for purchase of books/supplies at the Utah State University Bookstore and a one-quarter in-state tuition waiver, or for the senior recipient a $300 cash award.

Maeser-Bauer Undergraduate Award. Established in memory of Drs. Sherwin Maeser and Norman Bauer, a $75 scholarship award is presented annually to an outstanding junior or senior chemistry major. The award is given primarily for high scholastic achievement.

Maeser-Bauer Graduate Teaching Assistant Awards. In memory of Drs. Sherwin Maeser and Norman Bauer, two $100 awards are given annually upon recommendation of the Department of Chemistry and Biochemistry to outstanding graduate teaching assistants in good standing in the department.

Lawrence R. and Abelina MeGill Scholarships. Scholarships established by Lawrence R. and Abelina MeGill for students in Physics or Electrical and Computer Engineering. At least 50 percent of the recipients each year shall be female and/or members of an ethnic minority.

Physics Undergraduate Scholarship.

Thomas A. Riemondy Scholarship. A scholarship in memory of Thomas A. Riemondy, a deceased USU undergraduate Geology major. Awarded annually to an outstanding undergraduate Geology major who is not a resident of Utah.

Seely-Hinckley Scholarship. A scholarship established as a memorial for John H. Seely and Robert Hinckley. Awards are based on superior performance and financial need.

Richard J. and Marion A. Shaw Scholarship. A scholarship established by Richard J. and Marion A. Shaw to provide three quarters of tuition to a student majoring in biology with emphasis in plant biology. Applicants must be citizens of the U.S. who demonstrate high academic achievement, superior potential, personal integrity, and a high sense of social and moral responsibility.

Space Science Scholarship. A four-year scholarship for students interested in a career in space science (physics). A tuition-free scholarship the first year with subsequent years contingent upon good performance. During their academic career, students will possibly have opportunity to work with appropriate faculty members in space science and earn some subsistence. They will also develop an experimental payload to be flown on the space shuttle.

Harris O. and Eleanor Y. Van Orden Endowed Scholarship Award. Recipient must be an undergraduate chemistry major with a high academic record. The award consists of an in-state tuition waiver for two quarters.

J. Stewart Williams Graduate Fellowship. A fellowship in memory of J. S. Williams, first Geology Department head and first dean of the School of Graduate Studies. Awarded annually to Geology graduate students for thesis research on geology within the western conterminous United States.

Athletics

Scholarships

Information about any athletic scholarship is available at the Athletic Office. For more details, contact the office at (801) 797-1850 or write to: Athletic Office, Utah State University, Logan, UT 84322-7400.

Awards and Honors

Alpha Lambda Delta Award to Senior Students. Book Award. An award to a senior who has been an Alpha Lambda Delta member and who carries the highest grade point during four years of college.

Alpha Zeta Award. An award is made annually by Alpha Zeta fraternity honor society of agriculture students to the sophomore in agriculture who made the highest scholastic record in the freshman year.

The American Institute of Chemists Foundation Undergraduate Award. The award is to honor a senior student majoring in chemistry or biochemistry. The award is given in recognition of potential advancement of the chemical professions on the basis of a student's demonstrated record of leadership, ability, character, and scholastic achievement. The award consists of a calligraphed certificate and a one-year free Student Associate membership in AIC.

The American Legion Military Medal. A gift of the Logan American Legion Post, it is awarded each year to the athletic letterman who maintains the highest scholastic record during the year and who exhibits the most wholesome attitude toward military training.

American Society for Horticulture Science Award. A plaque will be presented to the outstanding senior in horticulture.

American Society of Animal Science Undergraduate Scholarship Awards. Certificates and medals awarded annually to sophomores, juniors, and seniors majoring in Animal Science who are in the top 10 percent of their class.

American Society of Civil Engineering Associate Memberships. Awarded annually to senior engineering students on the basis of scholarship, promise of success in engineering, personality, and ASCE student chapter activity. The awards consist of associate membership in the American Society of Civil Engineers. The first is given by the Intermountain Section of ASCE, the second by the Civil Engineering faculty, and the third by the student chapter of ASCE.

ASCE Membership Award. Junior membership in the American Society of Civil Engineers is awarded by the Intermountain Section, ASCE, to a graduating senior in civil engineering on the basis of scholarship, activities, and personality. Selection is made by the engineering faculty.

ASCE Student Chapter Award. Junior membership in ASCE to the senior doing most for the chapter. Selected by vote of members.

ASLA Merit and Honor Awards. The Utah Chapter of the American Society of Landscape Architects, in conjunction with the faculty of the Department of Landscape Architecture and Environmental Planning, present four awards to graduating seniors and graduate students annually. Candidates are judged on scholarship, professional experience, and the professional quality of their academic work.

Laura B. Aspaas Memorial Award. Cash award to an outstanding senior in the Geography and Earth Resources Department.

The Barnes Key. Rey and Marjorie Barnes award a key annually to an undergraduate student who is affiliated with the campus radio or television station. The student must have a cumulative grade point average of 2.5 or above, must have carried at least one radio class during the year of the award, and must have demonstrated a deep interest in furthering radio and television arts at Utah State University. Selection shall be made by the director of radio and television at USU, the person directly responsible for the campus radio station, and Rey L. Barnes.

Blue Key Award. Each year Blue Key Honorary Service Fraternity awards a "Service Plaque" to an outstanding freshman or sophomore male student. Candidates

are judged on University activities, scholarship, service to the University, and moral character. Application forms can be obtained from the organization and must be filed with the Blue Key Awards Committee on or before April 15.

Business Education Student Teacher Award. Presented to one or more senior student teachers who have exemplified superior ability in their student teaching experience.

Cache Valley Chapter of the Utah State Historical Society Award. The Cache Valley Historical Society offers annually an award of $25 to the USU student writing the best acceptable treatise on any phase or field of Cache Valley history. Papers must be submitted on or before the end of the spring quarter and become the property of the Cache Valley Historical Society.

College of Natural Resources Outstanding Senior Award. Awarded to the graduating senior in the College of Natural Resources who has maintained a high academic record and shows promise of achieving outstanding professional success.

Freshman Chemistry Handbook Award. A copy of the *Handbook of Chemistry and Physics* is presented to the students with the best scholarship record in the Principles of Chemistry course for science majors.

Chi Omega Sorority Award. An award of $25 is given annually to the female student majoring or minoring in social sciences who gives evidence of superior scholarship and ability to make a contribution to organized group life. The committee of awards is appointed by Chi Omega Sorority each year from the teaching staffs of the Sociology and Economics Departments.

Civil Engineering Faculty Award. Junior membership in the ASCE or ASAE is awarded by the engineering faculty to a graduating senior in engineering on the basis of scholarship and promise of success in engineering. Selection is made by the engineering faculty.

Virginia Dare Award. A cash award of $25 to the outstanding junior in dairy manufacturing.

Delta Beta Chi Award. Ten dollars is awarded annually by the Delta Beta Chi Chemistry Fraternity to the freshman or sophomore chemistry student who writes the best essay on some subject of chemistry.

Distinguished Service Awards. Awards are given annually to outstanding students in theatre, music, library, and physical education.

Division of Analytical Chemistry American Chemical Society Award. The Division of Analytical Chemistry of the American Chemical Society provides an award, which consists of a fifteen month subscription to the *Journal of Analytical Chemistry* and honorary membership in the Division of Analytical Chemistry to an outstanding undergraduate student who displays an aptitude for a career in analytical chemistry. The awardee must have completed his/her third undergraduate year and expect to be enrolled as a senior during the coming academic year.

Foreign Student Achievement Award. A certificate of achievement to a graduating foreign student from a non-English speaking country who has the highest scholastic average during undergraduate study.

Institute of Electrical and Electronic Engineers Outstanding Senior. A certificate given annually to a member of the local student chapter of IEEE.

Institute of Electrical and Electronic Engineers Paper Contest. A noncash award (e.g. a calculator) given to the winner of the annual technical paper contest.

LAEP Faculty Medal. The Faculty Medal is awarded annually to a senior or graduate student in the Department of Landscape Architecture and Environmental Planning. The medal is given to the outstanding student in the department based upon the judgement of the faculty. The award takes into account the academic record of the individual, their contribution to the department and the profession during their period of education, and, most importantly, their future potential contribution to the profession in practice.

Logan Kiwanis Club Trophies. Each year, the dean of each of the eight colleges selects an outstanding student in the college to receive the Kiwanis Club Plaque.

Virginia Jenkins Award. An award given to a male junior or senior student who has completed a mission for the LDS church. Contact Financial Aid Office for details.

Maeser-Bauer Graduate Teaching Assistantship Awards. In memory of Drs. Sherwin Maeser and Norman Bauer, two $100 awards are given annually upon recommendation of the Department of Chemistry and Biochemistry to outstanding graduate teaching assistants in good standing in the department.

Maeser-Bauer Undergraduate Scholarship Award. Established in memory of Drs. Sherwin Maeser and Norman Bauer, a $75 scholarship award is presented annually to an outstanding junior or senior chemistry major. The award is given primarily for high scholastic achievement.

Mechanical and Aerospace Engineers Faculty Award. An engineering handbook awarded annually to the mechanical or aerospace engineering senior with the highest grade point average. The award is made by the Mechanical and Aerospace Engineering Department faculty.

Merck Award. Merck and Company, manufacturing chemists, awards annually a copy of the *Merck Index* to an outstanding student in organic chemistry and biochemistry.

National Business Education Association Award. An award presented by the National Association for Business Teacher Education to the senior who has distinguished himself or herself in business education.

National Council for Geographic Education Award. An excellence of scholarship award given annually by the National Council for Geographic Education to the outstanding graduating senior in geographic education.

Outstanding Seniors in the College of Engineering. A plaque and a cash award given annually to the outstanding senior in each of the departments in the College of Engineering: Biological and Irrigation Engineering, Civil and Environmental Engineering, Electrical and Computer Engineering, Industrial Technology and Education, and Mechanical and Aerospace Engineering.

Outstanding Senior in the College of Engineering. A plaque and a cash award given annually at the Engineering Banquet to the outstanding senior in the college.

Outstanding Seniors in the College of Family Life. A plaque and cash award given annually at the Family Life Scholarship Banquet to the outstanding senior from each of the departments: Family and Human Development, Human Environments, and Nutrition and Food Sciences.

Outstanding Seniors in the College of Natural Resources. Annual awards given to one senior in each department of the college—Rangeland Resources, Forest Resources, Fisheries and Wildlife, Geography and Earth Resources, and the Watershed Science Unit. Based on academic achievement and demonstration of leadership in academic, political, and social activities. Selected by faculty in respective departments.

Drs. Myron D. and Ann Rice Award for Superior Performance in Business or Marketing Education. A $300 award for a student majoring in Business Education or Marketing Education who has exhibited superior performance in his or her field.

The ROTC Medal. A gift of the institution is awarded each year to the student in military science and tactics who most nearly represents the ideal that the Reserve Officers' Training Corps is striving to develop, upon the following basis: (a) character, 20 points; (b) scholarship, 15 points; (c) University activity, 15 points; (d) leadership, 20 points; (e) aptitude for and interest in Military Science, 20 points; (f) physique and bearing, 10 points.

Scholarship A's. In the form of a pin, these awards are given to undergraduate students who present evidence that their grades are all "A's" for three consecutive quarters of their residence. At least 15 credits must be carried. Contact the Enrollment Services Office for details.

Sigma Lambda Alpha Awards. Sigma Lambda Alpha is the National Honor Society in Landscape Architecture. Invitations and awards are made each year to outstanding upper-division and graduate students in the Department of Landscape Architecture and Environmental Planning. Awards are recommended by the faculty based on the scholastic records of the individual. The minimum grade point average for invitation is 3.2 or above.

Sigma Tau Award. To the outstanding sophomore engineering student for scholarship, sociability, and practicability. Selection made by the Alpha Delta Chapter of Sigma Tau, an honorary engineering fraternity.

Society of American Foresters Outstanding Senior Award. Annual award given by the Wasatch Front Chapter of the SAF to a student who has achieved academic excellence and who has been active in professional activities and the USU Student Chapter of the SAF.

Utah Association of Certified Public Accountants. An award for the purpose of stimulating interest, to the outstanding senior student majoring in accounting.

Utah State Historical Society Award. An award to the outstanding graduate majoring in history.

Utah State University Business Education Student Teacher Award. This honorary award is presented to one or more senior student teachers who have exemplified superior ability and excellence in completing their student teaching experience leading to the BS degree.

***Wall Street Journal* Award in Business.** A medal and one year's subscription to the *Wall Street Journal* is given for outstanding achievement in accounting.

***Wall Street Journal* Award in Business.** A medal and one year's subscription to the *Wall Street Journal* is given for outstanding achievement in business administration.

***Wall Street Journal* Award in Business.** A medal and one year's subscription to the *Wall Street Journal* is given for outstanding achievement in management and human resources.

***Wall Street Journal* Award in Economics.** A medal and one year's subscription to the *Wall Street Journal* is given for outstanding achievement in economics.

Colonel Joe E. Whitesides Award. This award is given to the outstanding student athlete selected by the Athletic Council on the basis of (1) academic achievement, (2) athletic achievement, (3) Army (ROTC) achievement, and (4) adjustment to meet the daily demands in character, social, and general culture.

Loans

The A Men's Athletic Association Loan Fund. Monies to be used for tuition and books by the direct descendants of A Men members. The A Men Association consists of individuals who received the athletic award A from USU prior to 1970. Monies must be repaid within 24 months after borrowing. For details, contact Director of Financial Aid.

James W. and Margaret E. Bingham Student Loan Fund. Senior students have priority to this loan fund, then junior students may borrow. The loans are to be repaid within a one-year period after the students graduate. Contact the Financial Aid Office for details.

The Edgar B. and Laura Cowley Brossard Loan Fund. An emergency loan account for needy junior and senior students given by the Brossards, alumni of Utah State University. Apply for these funds as an emergency loan through the Financial Aid Office.

Box Elder High School Loan Fund. For USU students who have attended Box Elder High School.

East Carbon Wildlife Federation Loan Fund. Provides up to $300 to deserving students in the College of Natural Resources for purposes related to the continuing of their education. For details contact the dean's office, College of Natural Resources.

Orson A. and Rae N. Christensen Loan Fund. From a generous gift of the Christensens, a loan fund at a low interest rate is set up to help students through school. The accrued interest goes to create scholarships in the College of Business. Apply for these funds as an emergency loan through the Financial Aid Office.

J. Reuben Clark Small Loan Fund. A reserve specifically provided for assistance to students in meeting school obligations.

Annie Givens Anderson Gardner Loan Fund. This loan is for needy freshman women with no previous college training who are members of the Church of Jesus Christ of Latter-day Saints in good standing. Apply for these funds as an emergency loan through the Financial Aid Office.

Edwin and Josephine Gossner, Sr. Cooperative Education Student Loan Fund. For students attending USU; 30 percent of the fund is reserved for native American students. The loans are to be repaid within a six-month period. Contact the Director of Cooperative Education for details.

Intercollegiate Knight Loan Fund. Loan fund provided by the Intercollegiate Knights for needy USU students.

O. W. Israelsen Memorial Loan Fund. Upper-division or graduate students in irrigation and drainage engineering may use this fund.

Robert L. Judd Loan Fund. This loan fund was given by Mrs. Judd in honor of her late husband. Loans are available to undergraduate men who have ability and need financial assistance. Apply for these funds as an emergency loan through the Financial Aid Office.

Editha Smith Kent Loan Fund. Dr. Melvin Kent gave this generous gift to be used as a loan fund in honor of his wife, Editha Smith Kent. The Kents are both USU alumni. The fund is used to provide student loans at a low interest rate. Apply for these funds as an emergency loan through the Financial Aid Office.

Henry Lane Memorial Fund. Established by his sons, Sid and MacArthur Lane, in memory of their father. This loan fund is to be used by black varsity athletes.

Vera Nielson Langford Loan Fund. From a generous gift, a loan fund to be used by needy home economics students.

Latin American Student Loan Fund.

Larue H. Merrill and Ida K. Merrill Loan Fund. An emergency loan fund for senior students given by the Merrills, alumni of USU. Monies are to be repaid within a maximum of 12 months after graduation. Contact Financial Aid Office for details. Apply for these funds as an emergency loan through the Financial Aid Office.

George A. Meyers Loan Fund. Established in memory of Dr. Meyers, a friend and benefactor of foreign students, for their emergency needs. Apply for these funds as an emergency loan through the Financial Aid Office.

Edgar B. and Laprile B. Mitchell Loan Fund. This loan fund was established for students who are in need of financial assistance to commence or continue their education at Utah State University. The loan shall be made only for undergraduate students. Apply for these funds as an emergency loan through the Financial Aid Office.

Marjorie Paulsen Loan Fund. A fund provided by the father of a former Aggie student active in student body affairs.

Arthur Pirsko Loan Fund. Provides up to $300 to deserving students in the College of Natural Resources for purposes related to the continuing of their education. For details contact the dean's office, College of Natural Resources.

W. B. Rice Memorial Loan Fund. This loan fund provides loans up to $300, usually for one year, to deserving students in the College of Natural Resources. Application is made to the dean's office.

Senior Loan Fund. A gift of the class of 1911, and added to by the class of 1922, has helped many students complete school.

Margaret Sigler Loan Fund. A short-term loan of $100 to be repaid by the student in a specified time period with no interest charges. Contact Women's Center.

H. Grant Stephens Loan Fund. A special borrowing fund with minimum interest rates to be used with pressing financial needs. Given in honor of Mr. Stephens by his children. Apply for these funds as an emergency loan through the Financial Aid Office.

Lewis M. Turner Loan Fund. Provides up to $300 to deserving students in the College of Natural Resources for purposes related to the continuing of their education. For details contact the dean's office, College of Natural Resources.

Ichel Water Loan Fund. An individual gift to assist students in need.

Intercollegiate Athletics—Men and Women

Athletic Director: Chuck Bell

Office in Spectrum Addition 202M

tel. (801) 797-1850

Associate Athletic Director for External Operations: John E. Glass
Associate Athletic Director for Internal Operations: Mary Ellen Cloninger
Assistant Athletic Director, Business: Ken Peterson
Assistant Athletic Director, Media Relations: John G. Lewandowski
Assistant Athletic Director, Ticketing: Louie Krutsch
Assistant Athletic Director for Support Services and Head Trainer: Dale P. Mildenberger
Assistant Athletic Director for Marketing and Promotions: Kevin Rochlitz
Student-Athlete Services Coordinator: Mark D. Nelson
Assistant Student-Athlete Services Coordinator: Ken Mitchell
Assistant Student-Athlete Services Coordinator: Sabrina White
Associate Media Relations Director: Dave Hardee
Media Relations Assistant: Jennifer Longe
Faculty Representative: Mike Parent
Compliance Officer: Lucy Stolpe

Head Coaches:

Basketball: Larry R. Eustachy
Football: John L. Smith
Golf: Dan W. Roskelley
Gymnastics: Ray Corn
Soccer: Stacey Enos
Softball: Lloydene Searle
Tennis (Men's and Women's): Chris Wright
Track and Field (Men's and Women's): Gregg Gensel
Volleyball: Ginny Alexander

Assistant Trainer: Fawn Michel
Head Strength and Conditioning Coach: Milt White
Equipment Supervisor: Craig A. Hopkins

The Intercollegiate Athletics program at Utah State University encourages excellence in academic and athletic performance. The program is designed to develop qualities of leadership, sportsmanship, and individuality, helping each student-athlete to realize his or her ultimate capabilities.

Utah State's Intercollegiate Athletics operates under the direction of the National Collegiate Athletic Association (NCAA), the Big West Conference, and Utah State University. The Aggies compete at the NCAA Division I level in 14 sports, including men's football, women's volleyball, men's and women's cross-country, men's basketball, men's and women's indoor track and field, women's gymnastics, women's softball, men's golf, men's and women's tennis, and men's and women's outdoor track and field. Utah State will also participate in women's soccer, beginning in the fall of 1996.

The Aggies have a storied history, gaining national attention in recent years in a number of different sports.

The Utah State football program has proved to be a breeding ground for NFL talent, sending numerous players to the professional ranks in recent years. Since 1980, 33 former Aggies have seen action in the NFL, along with a number of players who have played for CFL teams.

The Aggies finished the 1993 season with a 7-5 record, which included a 58-56 win over intrastate rival Brigham Young University. Having also won a share of the Big West Championship, the Aggies earned a trip to Las Vegas Bowl II, where they defeated Mid-America conference champion Ball State, 42-33. In 1994, the Aggies finished the season at 3-8.

Under the direction of three-time Big West coach of the year Gregg Gensel, the Utah State men's cross country team has won the Big West Conference title every year since 1992. The 1994 women's cross country team placed third at the Big West Championships for their highest finish ever.

Since 1970, the USU basketball team has competed in the NCAA post-season tournament seven times and in the National Invitational Tournament three times, including last season when the Aggies hosted Illinois State for the first round of the NIT.

Under the leadership of head coach Larry Eustachy, the 1994-95 Aggies tallied a 21-8 record, their best since the 1987-88 season, and won their first conference championship since 1980.

The Aggie gymnastics "dynasty" has sent teams to the national championship five times and to regional championships 16 times in the last 17 years. The 1995 team finished the season ranked 18th in the nation and placed sixth at the regional championships.

Scholastically, the team ranked 10th in the nation in 1993, making the Aggies one of only five teams nationwide to be ranked in the top 20 both competitively and academically.

The 1994-95 track and field teams enjoyed success as the women's team won its third consecutive Big West Conference outdoor championship and the men's team claimed its second straight outdoor conference title.

The Utah State softball team has also shared in the University's winning tradition, bringing home Utah State's most recent national championships in 1980 and 1981.

During the 1995 season, the Aggies went 31-28, marking the 14th time in the last 16 seasons Utah State has finished with a winning record.

The following Aggies have also made their mark during the past year:

Junior center Eric Franson was named the Big West Conference basketball player of the year after leading the conference in scoring and field goal percentage and finishing second in rebounding. Franson was also named a second-team Academic All-American.

Senior guards Roddie Anderson and Corwin Woodard earned second-team All-Big West basketball honors.

Second-year Aggie head coach Larry Eustachy was named the Big West's basketball coach of the year.

Senior gymnast Tricia Yamamoto won the Big West Conference all-around competition and earned a spot at the NCAA Championships in Athens, Georgia, as the Number 6 at-large qualifier. Yamamoto set six school records and earned all-conference honors on floor and bars in addition to the all-around. She also became the first Aggie gymnast to break the 39 mark on the all-around.

Sophomores Deanna Palmer (vault) and Shannon Passe (beam) also earned All-Big West honors in gymnastics.

Freshman pitcher Tara Thompson, who earned honorable mention All-Big West honors, set a school record by striking out 13 batters in a single game. She also posted the third-longest consecutive scoreless innings streak in Aggie history, pitching 35 straight shutout innings.

Sophomore Rhealee Thorn and senior outfielder Tracy DelRio earned second-team all-conference honors.

Freshman James Parker was named the Big West Conference athlete of the year after winning the hammer, discus, and shot put. Parker also earned All-American honors during the outdoor season in the hammer throw.

Senior Lance White earned All-American honors in indoor track and field on the pole vault. White, along with Parker and sophomore LaDonna Antoine qualified for the NCAA Outdoor Track and Field Championships in Knoxville, Tennessee.

Distance runner J'Dee Wilson was named third-team Academic All-American.

Numerous outstanding individual athletes have also represented the Aggies throughout the years, many earning All-American honors.

In football, former All-American Merlin Olsen went on to earn NFL Hall of Fame honors, as well as becoming a well-known television personality. Merlin also leads a group of three players that have earned Academic All-American honors. The group includes Gary Anderson and Randy Stockham. Defensive tackle Steve Neeleman was named second team academic All-American following the 1991 season.

Merlin's brother, Phil, also earned consensus All-American honors while at Utah State. Phil also had a successful career in the NFL with the Denver Broncos and the Los Angeles Rams.

In track and field, four Olympians and 13 All-Americans have competed for the Aggies, including former world record holders L. Jay Silvester and Mark Enyeart.

Jay Don Blake became Utah State's first NCAA National Champion in golf, winning the title in 1980 and finishing second the following year.

Aggie basketball boasts the legacy of Wayne Estes, an All-American in the early sixties before his untimely death.

Three Aggie gymnasts have earned All-American honors and two others have represented their countries in the Olympics and World Championships.

Lena Adomat twice represented Sweden in the Olympics, while Wanita Lynch competed for Australia in the 1976 Olympics.

Seven different athletes earned All-American honors in volleyball 12 times.

The softball team can be proud of the past as well. Four players earned All-American honors during their careers. Former Aggie shortstop Kelly Smith is the only Aggie to have earned All-American status for three straight years (1984-86).

Utah State's past wrestling program also boasted 11 All-Americans and one Academic All-American (Bob Erickson).

Participation. As members of the Big West Conference, the Aggies play conference schedules in basketball, football, softball, and volleyball. The conference winner in these sports earns an automatic bid to NCAA post-season play, with the exception of football. The conference winner in football earns a berth in the Las Vegas Bowl in Las Vegas. In addition, conference championships are held in cross-country, golf, tennis, and outdoor track and field. The gymnastics team will contend for post-season participation via the NCAA Midwest Region Championships.

Not only does the University's 1995-96 competition schedule include the likes of nationally-recognized Big West opponents, but the Aggies will face noted nonconference teams such as: BYU, Utah, Weber State, Colorado State, Boise State, Southern Mississippi, Kansas State, Texas A&M, Rice, Houston, Arizona State, Hawaii-Hilo, Witchita State, Toledo, Minnesota, Nebraska, Oregon, and Southern Illinois just to name a few.

Facilities. Excellent training and competition facilities are provided in all sports.

E.L. "Dick" Romney Stadium, home of the Aggie football team for over 25 years, seats 30,257 cheering fans each week during the season. In an effort to update the facility, a state-of-the-art lighting system was installed prior to the 1993 season. Future plans for Romney stadium include expanding seating capacity to 40,000 seats and the construction of a multi-storied complex at the south end of the stadium to consolidate academic support to the student-athletes. Future plans also include the expansion of the press box with the installation of two elevators.

Basketball, gymnastics, and volleyball are played in the 10,270-seat Dee Glen Smith Spectrum. Basketball practices are held in the Spectrum, while the HPER building is the practice home for the gymnastics and volleyball teams. The recently renovated gymnastics practice gym has been labeled as one of the nation's finest, complete with vaulting pits and foam-spring exercise floor.

The Nelson Fieldhouse is the home of the Aggie indoor track and field teams. The teams practice on a 200-meter tartan track. The fieldhouse is also used by the softball and tennis teams for practice during late winter months. For the outdoor season, Ralph Maughan Stadium is the home for the men's and women's track teams.

The women's softball team will begin the 1996 season on the newest addition to the athletic facilities, Aggie Field. The 200-seat facility is scheduled to be completed by the beginning of the 1996 season and will host over 20 games during 1996.

The tennis teams play on the HPER courts, while the men's golf team practices and plays at the Birch Creek Golf Course and the Logan Golf and Country Club.

Scholarships. Utah State offers partial and full scholarships in each of the 14 sponsored sports. A student or prospective student desiring consideration for one of these awards may contact one of the coaches for further information about scholarship applications.

Registration and Eligibility. Registration for athletic participation in Aggie athletics may be accomplished by contacting any of the coaches or the athletics office. Eligibility for participation is governed by the rules and regulations established by the NCAA, the Big West Conference, and by Utah State University.

Supervision. Supervision and direction for men and women is vested in the director of athletics and the Athletic Council, consisting of the president of the University, and members of the faculty, the alumni, and student organizations.

University Extension

Office in Agricultural Science 209, 797-2200

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Assistant Vice President, Continuing Education: Rex L. Tueller

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Assistant Supervisors, 4-H Youth Programs: Carla D. Lee, Rebecca S. Mitchell
Supervisor, Community Development Programs: David L. Rogers

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Department Head (Provo): Steven D. Cox
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Director, Class Division: David A. Medlyn
Hill Air Force Base/Ogden Center: Terry R. Teigeler
Independent Study: Gary S. Poppleton
Evening School: "H" K. Hancock
Enrichment Classes: Louis D. Griffin
Brigham City Branch Campus: Lou J. Workman
Tooele Branch Campus: Vincent J. Lafferty
Com-Net: Louis D. Griffin

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Programmers: Lisa Anderson, Tom Borg
Director, Management Institute: Glenn M. McEvoy
Director, Professional Continuing Education and Outreach Programs: Dallas L. Holmes
Continuing Education Facilities: Donald L. Wright
Business Manager: Steven R. Broadbent
Administrative Assistant to Vice President: Marlene Berger
Administrative Assistant, Continuing Education: Arla Swensen
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Agronomist (Weeds): Steven A. Dewey
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Entomology: Diane G. Alston, Ted Evans, Jay B. Karren
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Refugee Programs: Tuyet Seethaler
Soil Science and Water Use: Richard T. Koenig
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Sevier: Clyde J. Hurst, Nyle J. Matthews, Diane J. Reese
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Tooele: F. Brent Bunderson, Lee Sherry
Uintah: Boyd M. Kitchen, Ronda H. Olsen, Chad R. Reid
Utah: JoLene B. Bunnell, W. Craig Burrell, Steven D. Cox, Brent L. Gledhill, Judy L. Harris, Anthony H. Hatch, Jim C. Jensen, F. Dean Miner
Wasatch: Debra G. Proctor, Val D. Warnick
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Weber: James V. Barnhill, Teresa Brooks, Kay L. Evans, Teresa Hunsaker, Ben L. Tueller

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Natural Resources: Charles W. Gay
Science: Antone H. Bringhurst

University Extension

Office in Agricultural Science 209, 797-2200

University Extension includes the Cooperative Extension Service and the Continuing Education Programs, the latter encompassing the Conference and Institute Division, Class Division, Independent Study (correspondence home-study), evening school, enrichment classes, Uintah Basin Branch Campus (Roosevelt), and Southeastern Utah Center (Moab).

Cooperative Extension Service

The Cooperative Extension Service is sponsored and financed jointly by federal, state, and county governments. There is a Cooperative Extension Service in the land grant institution of each state.

The main functions of the Cooperative Extension Service are to develop leadership, resourcefulness, and initiative; to supply factual information for discovering and solving problems; and to help people become more efficient, increase their income, improve their home and community environment, and raise their standard of living. University Extension takes the findings of research to the people of the state and brings unsolved problems back to the research workers at the University.

Extension programs are planned with the people. The demonstration method of teaching and mass media are used extensively. Group meetings, short courses, and publications are used to supply educational information.

Administrative and some supervisory personnel and subject matter program leaders are located on the USU campus. In addition, a field staff consisting of district supervisors, area specialists, area agents, county agents, home economists, and program aides serve the people in all areas of the state.

The Extension program includes work with both adults and youth.

Major program areas are centered around (1) agriculture, (2) 4-H youth, (3) family living, (4) community development, and (5) international extension.

Central in the function of University Extension is problem solving at the community level. Through research provided by the departments of the University, the community becomes a laboratory in the teaching-learning process. Community problems are extremely varied and complex. Consequently, University Extension educational programs designed to benefit the community require creativity and innovation of the colleges and departments according to their areas of competency.

To carry out this function, Extension programs at Utah State University focus on the knowledge competencies from the appropriate disciplines on four broad areas of concern to people of Utah: physical environment, social environment, economic and industrial development, and education instructional services.

Continuing Education Programs

During the past two decades, faculty and administration of the University have strengthened service to residents through the development of the Continuing Education Programs, a combination of advanced educational philosophy and educational practice. Continuing Education is a growing concept in higher educational philosophy. It recognizes that learning is necessary and takes place throughout one's life, from adolescence through retirement. Continuing Education provides opportunities for professional or vocational learning, and also provides for lifelong enrichment through participation in social and cultural programs. Through such programs, persons of all ages are able to enrich their lives and increase their knowledge without disrupting their employment or life-style.

Kellogg Life Span Learning Complex. The W. K. Kellogg foundation and other private funding sources have made it possible to build three new structures, centrally located on the campus, for Continuing Education Programs. The five-story University Inn is located in an area between the Taggart Student Center and the Agricultural Science Building. The 53,079 square foot, five-story facility contains 75 modern motel-type rooms, two of which are suites, to house those who come to campus for a great variety of new programs.

The 39,143 square foot, three-story Conference Center is located between the Agricultural Science Building and the Library. The spacious conference meeting rooms overlook the beautiful quad area near the intersection of the two major malls serving the campus. The new facilities have been designed to utilize the most modern technology that could be anticipated in conducting educational programs. The conference facilities include twelve meeting rooms ranging from a 400-seat auditorium to small seminar rooms for 10 to 30 people. Administrative offices for Continuing Education Programs are also located in the Conference Center. Individuals and groups of all ages are encouraged to investigate this expanded resource of Utah State University as a means of pursuing their unique educational goals.

Conference and Institute Division. The responsibility for conferences, short courses, symposiums, seminars, and institutes is vested in the Conference and Institute Division of Continuing Education. The role of this office is to promote, coordinate, and administer conference programs in cooperation with faculty members of the various campus organizations and with individuals and groups outside the University. Noncredit courses and tours are also organized by this office in cooperation with the academic departments of the University.

There are no limitations in terms of age or educational background on the clientele to be served through the Conference and Institute Division. All that is required is a desire to learn. The scope of the program will be as broad as available knowledge resources will permit.

Continuing learners may participate in educational activities for a variety of justifiable reasons, all of which relate to recognized needs for self-improvement, an appetite for intellectual stimulation through social interaction, or simply a desire to know.

Management Institute. The Management Institute is an outreach unit of the College of Business with the responsibility of assisting executives, middle managers, supervisors, and professional specialists from all forms of organizations to meet their training and development needs. The institute maintains flexibility in responding to requests of clients. It tailors the length

and content of programs, presents them either on or off campus, and conducts them for persons from different organizations or for individuals from a specific organization.

Continuing Education

A large number of people living in communities or areas remote from the University campus desire to benefit from university training but cannot come to Logan to register for resident courses. For this group, USU provides a liberal program of Continuing Education which includes off-campus classes, Independent Study (correspondence), evening school, and a number of other educational services. USU is a member of the National University Continuing Education Association.

Courses offered by USU are made available to approximately 30 different communities of the state through seven outreach centers of the University. Such courses are offered by the respective academic departments. Off-campus credit courses are equivalent in content hours of class instruction and preparation, and otherwise meet the same prerequisites as comparable classes offered on the University campus.

Classes may meet the requirements for a bachelor's degree, as determined by the individual departments and colleges. They also may meet the requirements for a master's degree with approval of the School of Graduate Studies.

All instructors in class division courses are either members of the regular University teaching faculty officially assigned to the teaching project concerned or nonresident members approved by the head of the department and by the college administration.

The registration fees charged for classes conform to regulations of the Board of Regents. Fees may not be less than the on-campus tuition and may be more if warranted by the additional expense of conducting the class off campus.

Independent Study

Many individuals desire organized, systematic instruction but live in isolated areas, or for other reasons cannot meet for class instruction on the University campus or its resident centers. For such individuals, USU provides a liberal offering through a wide variety of Independent Study courses in many departments of the University. This program furnishes an excellent opportunity to students of high school or college level and to adults who desire general education and professional improvement in selected fields.

For admission to Independent Study courses, an enrollee must be at least 19 years of age or a high school graduate, or must submit 15 credits of high school work.

High school students demonstrating superior ability may enroll for University credit courses.

As many as one-fourth of the credits necessary for a bachelor's degree may be earned by completing Independent Study courses (45 credits). Each college of the University, subject to faculty approval, determines the nature and amount of Independent Study credit accepted for admission and graduation. In no case is Independent Study credit to comprise more than 25 percent of the total number of credits accepted for graduation. Independent Study courses are **not** accepted for graduate degrees.

Graduation Deadline. Seniors who plan to apply Independent Study credits toward graduation in any one year must have their courses completed by May 1, so that lessons and examinations may be evaluated and credit filed in the Enrollment Services Office two weeks prior to the day of graduation.

An enrollee is allowed one year from the registration date in which to complete a course. An extension of time may be granted upon payment of a small fee. Students who qualify for federal student aid must finish Independent Study courses within a designated quarter.

Fees. A fee of $40 per credit is charged for Independent Study courses. All fees are subject to change.

Independent Study Catalog. Anyone interested in Independent Study may request a catalog containing complete information concerning this program by writing to the Independent Study Division, Utah State University, Logan, Utah 84322-5000, or phone 797-2137.

Evening School

The Evening School provides a source of continuing education for those students unable to attend classes on the regular University schedule. In reality, the Evening School is an extension of the daytime program at USU. The classes and faculty are the same, and the credit is the same as if it were earned during the day.

As a convenience to students, coursework has been combined into one class period per week. For example: students can take a three-credit course one evening a week, or one class Friday evening and one Saturday morning as part of the weekend college concept.

Further information can be obtained by contacting the Evening School staff in room 102 of the Eccles Conference Center or by calling 797-2075.

Enrichment Classes

These noncredit classes are available through the Extension Class Division of the University. Examples of classes include ballet, ceramics, woodworking, banjo, guitar, home repair, horseshoeing, income tax preparation, karate, photography, sign language, swimming, gymnastics, women's body conditioning, auto body repair, small engine repair, tennis, golf, and many others. Classes are held during evening hours for the convenience of University employees, students, and townspeople desiring to participate in the program. For information, contact the Enrichment Class Office, Computer Center, Room 201, or phone 797-2079.

Uintah Basin Branch Campus

USU established a Continuing Education Center in the Uintah Basin at the beginning of fall quarter 1967. This center has recently been upgraded to the status of Branch Campus.

A program of seminars, short courses, undergraduate, and graduate courses is offered in several communities located in Uintah, Duchesne, and Daggett Counties.

The Uintah Basin Branch Campus office is located at Roosevelt, Utah.

Southeastern Utah Center (Moab)

The state legislature authorized funds for the establishment of the Southeastern Utah Center effective July 1, 1969.

Major objectives of the programs include implementing a series of lower-division undergraduate credit courses, a limited program of upper-division and graduate classes, fine arts programs, seminars, short courses, and lecture series.

University Research

Vice President for Research: Peter F. Gerity
Office in Research and Technology Park, Suite 120, 797-1180
Associate Vice President for Research: H. Paul Rasmussen
Office in Agricultural Science 225, 797-2207

Research Programs

Utah Agricultural Experiment Station: Director H. Paul Rasmussen
Engineering Experiment Station: Director A. Bruce Bishop
Utah Center for Water Resources Research: Director David S. Bowles
Utah Water Research Laboratory: Director David S. Bowles
Ecology Center: Director Frederic H. Wagner
Center for Atmospheric and Space Sciences: Director Robert W. Schunk
Utah State University Research Foundation: President and CEO Bartell C. Jensen
Center for Persons with Disabilities (CPD): Director Marvin G. Fifield
Bureau of Research Services, College of Education: Associate Dean Ron J. Thorkildsen
Institute of Political Economy: Director Randy T. Simmons
Economics Research Institute: Director Herbert H. Fullerton
Institute for Land Rehabilitation: Interim Director John C. Malechek
Cache County Study in Memory and Aging: Principal Investigator Dr. John C. S. Breitner, Duke University; **Co-Principal Investigator** Bonita W. Wyse, Dean, College of Family Life
Federal Interagency Natural Resources and Environmental Analysis and Synthesis Center: Director Joseph A. Chapman
Utah Division, UCAN (UT, CO, AZ, NM) Consortium: Director Carolyn G. Barcus

Research Supporting Activity

Contract and Grant Office: Director M. Kay Jeppesen

Research Committees

University Research Council: Chairman Peter F. Gerity
University Safety Committee: Chairman David B. Drown
Radiological Safety Committee: Chairman LeGrande C. Ellis
Committee on Experimental Animals: Chairman Stanley D. Allen
Committee on Human Subjects: Chairman Brent C. Miller
Institutional Biosafety (RDNA) Committee: Chairman John D. Morrey
Indirect Cost Waiver Committee: Secretary M. Kay Jeppesen
Biohazards Committee: Chairman Robert W. Sidwell
Chemical Hygiene Committee: Chairman William A. Brindley
State Arboretum at Utah State University: Mary E. Barkworth

Cooperative Research Units

Utah Cooperative Fish and Wildlife Research Unit: John A. Bissonette
USDA Forestry Sciences Laboratory: Raymond W. Brown

USU was among the first of the colleges and universities in the intermountain area to have a research program. Originally research was principally in agriculture. Now research projects span every college and virtually all departments of the University.

Research is closely associated with teaching and student laboratory activities. Most research is conducted by faculty and staff members who are actively involved in teaching.

Many graduate and undergraduate students are employed to assist in research. The experience thus gained by students is an important part of their education.

Research affiliated with the University is under the general administration of the Vice President for Research. Actual research operations are conducted in colleges and departments and within the research units designated above.

Research stipends are available for many graduate students within the several colleges and research units. Opportunities exist for multidisciplinary programs through such units as the Ecology Center, the Center for Atmospheric and Space Sciences, the Utah Agricultural Experiment Station, the Institute for Land Rehabilitation, the Center for Biotechnology, and the Center for Water Resources Research. There are numerous well-equipped laboratories such as the Utah Water Research Laboratory, the Space Dynamics Laboratory, the Center for Persons with Disabilities, the many facilities of the Utah Agricultural Experiment Station, and in Biology and Natural Resources.

Policies on research and requests for support are reviewed by the University Research Council. Present members of the council and the area each represents are: Peter F. Gerity, chairman; G. Jay Gogue, Provost; Rodney J. Brown, Agriculture; H. Paul Rasmussen, Utah Agricultural Experiment Station; Joseph A. Chapman, Natural Resources; David B. Stephens, Business; James A. MacMahon, Science; Izar A. Martinez, Education; A. Bruce Bishop, Engineering; Brian L. Pitcher, Humanities, Arts and Social Sciences; James P. Shaver, School of Graduate Studies; Glenn R. Wilde, Learning Resources Program; Bonita W. Wyse, Family Life; David S. Bowles, Utah Water Research Laboratory; Dennis L. Welker, Faculty Senate; and two student members.

Division of

University Research

Vice President for Research: Peter F. Gerity
Office in Research and Technology Park, Suite 120

The policy of the University is to encourage and support research and all forms of creative, scholarly activities by faculty and staff members. Much of the research is supported by funds directly assigned to various administrative units of the University. Unrestricted funds for general support of research are administered through the Division of Research.

The Division of Research serves as a coordinating center for all research associated with the University. General policies and procedures pertaining to research and the promotion of a coordinated research program are the responsibility of the University Research Council.

Agricultural Experiment Station

Director: H. Paul Rasmussen

Office in Agricultural Science 225

The Agricultural Experiment Station, a major division of the University, was established in 1888 when the territorial legislature passed a bill creating Utah Agricultural College and Utah Agricultural Experiment Station. It is commissioned by state and federal legislative acts to conduct the research needed to conserve and manage natural resources; to produce, prepare, and market food and fiber; and to develop and improve rural living.

The Experiment Station fulfills its responsibilities with more than 130 full- or part-time professional staff members located in 14 departments of the University. The staff includes about 35 employees of the U.S. Department of Agriculture who collaborate in agricultural research activities. A large number of undergraduate and graduate students are employed on a part-time basis to assist with the research.

The Experiment Station investigations include more than 200 research projects, ranging from applied field tests to fundamental research under controlled laboratory conditions.

Experiment Station research is periodically reviewed by advisory committees representing all of the agricultural industries. These committees evaluate the research progress and recommend areas for further study.

Most of the research facilities of the Experiment Station are on the USU campus, distributed in various University buildings. In addition, the Experiment Station operates other farms and associated research facilities distributed throughout the state. Field tests and studies of industries and communities are conducted on a short-term basis at more than 100 other locations each year.

Engineering Experiment Station

Director: A. Bruce Bishop

Office in Engineering Class 110B

The Engineering Experiment Station, as part of the College of Engineering, has the broad purpose of furthering engineering sciences; engineering research, design, and development; and engineering education. The station was established in 1918 and is financed by mineral lease funds and federal, state, and industrial grants.

The director of the Engineering Experiment Station, the engineering department heads, and the individual faculty members share the responsibility to develop engineering research programs to advance knowledge and to serve the needs of the state and the nation. Interdisciplinary programs are encouraged. Financial support and professional training for graduate and undergraduate students are provided in the research programs.

Faculty members with similar and complementary talents have organized into working groups which appropriately identify their areas of research. The mutual stimulation and organizational visibility thus achieved aids in mounting effective attacks on engineering problems encountered by the state and nation. Some of the recent areas of research in the Engineering Experiment Station include irrigation and water management, toxic and hazardous wastes management, solid waste compression, risk assessment, transportation, structural systems, geotechnical analysis and buried structures, CAD/CAM, robotics and automation, thermal and cryogenic systems, image processing and compression, computer networking, parallel computing, neural networks, and virtual reality.

Utah Center for Water Resources Research (UCWRR)

Director: David S. Bowles

Associate Director: R. Ryan Dupont

Council Members: A. Bruce Bishop, Chair; David S. Bowles, Rodney J. Brown, Joseph A. Chapman, Peter F. Gerity, James A. MacMahon, Brian L. Pitcher, H. Paul Rasmussen, Frederic H. Wagner

Office in Utah Water Research Laboratory

Purposes of the Utah Center for Water Resources Research are to (1) foster interdepartmental research and educational programs in water resources, (2) administer the State Water Research Institute Program funded through the U.S. Geological Survey at USU for the State of Utah, and (3) provide University-wide coordination of water resources research.

The governing body for the Utah Center for Water Resources Research is a council composed of the deans of the Colleges of Agriculture, Engineering, Natural Resources, Science, and Humanities, Arts and Social Sciences; directors of the Utah Agricultural Experiment Station, Utah Water Research Laboratory, and Ecology Center; and vice president for research.

To foster interaction of the water research programs at USU with state needs, a Citizen Advisory Council for Water Resources Research has been established. The council has representatives from various economic sectors, water professionals, and administrative policy-makers. The Citizen Advisory Council serves both the UWRL and the UCWRR.

All University faculty engaged in water resources education or research are considered associates of the center. The center promotes and coordinates the development of research and instructional programs that will further the training of water resource scientists and engineers. It maintains liaison relationships with appropriate state, national, and international organizations and agencies having similar objectives.

Utah Water Research Laboratory (UWRL)

Director: David S. Bowles

Associate Director: R. Ryan Dupont

Administrative Associate Director: Steven H. Iverson

The Utah Water Research Laboratory houses one of the finest facilities in the country for research in groundwater, hydraulics, environmental engineering, hazardous waste management, water resources, and hydrology. Campus-wide interactions give all of these programs a strong interdisciplinary flavor that few other programs can match. The building provides more than 102,000 square feet of research space that is intensively used for a wide variety of studies. The faculty, students, and technical support personnel connected formally or informally with the laboratory (totaling approximately 200 individuals working on over 150 projects during the 1995 fiscal year) provide and train a breadth and depth of expertise important for water resources management in the state, nation, and world.

Facilities. The hydraulic testing utilizes flows up to 180 cfs on model studies served by a variety of flumes, channels, pumps, pipelines, weighing tanks, and supporting instrumentation. Environmental research is served by gas chromatographs, high pressure liquid chromatographs, a gas chromatograph/mass spectrophotometer, an ion chromatograph, liquid scintillation counters, an atomic absorption spectrophotometer, an inductively

coupled plasma emission spectrophotometer, and microscopy, bioassay, Ames test, and toxicity testing capabilities.

Program and Staff. The laboratory serves as a research arm to state and local agencies with water and environmental problems, and it conducts research on a wide variety of topics affecting agricultural, municipal, industrial, and recreational users of water. Both basic and applied research are joined in practical problem solving.

A diversified staff of internationally recognized experts conducts multidisciplinary studies in surface and groundwater management. The expert teams draw from engineering, chemistry, biology, meteorology, sociology, economics, political science, forestry, fisheries, and other fields. The research program addresses hazardous waste management, groundwater development, water supply and systems operation optimization, water resources planning at the river basin scale, cavitation, flow transients, hydraulic structure design, use of satellite data in hydrologic analysis, risk-benefit assessment, dam safety, effects of climate change, and water education in public schools.

Academic and Research Liaison. The Utah Water Research Laboratory and the Utah Center for Water Resources Research have the same Citizen Advisory Council. Research at UWRL is closely linked to academic programs through graduate research and joint appointments for professorial staff who have teaching assignments in academic departments.

UWRL assistance helps students financially and academically. The "tutorial" relationship between student and professor develops experience in research methods and introduces fresh new ideas about real world problems into the formal training programs of water scientists and engineers. During the 1995 fiscal year, more than 80 graduate students received research assistantships and made important contributions to the science and practice of water resources and environmental quality management.

Center for Atmospheric and Space Sciences

Director: Robert W. Schunk

Office in SER 246

Dean of Science: James A. MacMahon

The Center for Atmospheric and Space Sciences is recognized both nationally and internationally for its research programs. Through this interdisciplinary center, research is conducted by faculty and student teams in many widely varied areas of atmospheric and space sciences and associated disciplines.

The capabilities and strengths of the USU atmospheric and space research program have been repeatedly demonstrated through the completion of many successful research programs. Since 1970, USU has launched more than 90 rocket-borne payloads, more than eight high-altitude balloon-borne payloads, and participated in many aircraft-borne research programs. The instrumentation included on these vehicles has ranged from simple experiments aboard small meteorological-type vehicles to large, complex, recoverable payloads designed expressly for comprehensive studies of atmospheric and ionospheric parameters. In addition, various individuals have participated in ESA and NASA spacecraft programs. Ground-based research includes the Bear Lake Observatory operated by USU and experiments at most of the U.S. chain of incoherent-scatter radars (Sondrestrom, Millstone Hill, Arecibo, Jicamarca). Also, studies of low-latitude ionospheric electrodynamics using incoherent scatter radars, satellites, and Fabry-Perot measurements have been conducted. An extensive theoretical/modeling program is currently active in CASS. Large-scale three-dimensional numerical models have been developed to describe the ionosphere, the atmosphere, the plasmasphere, and the polar wind. Space contamination models describing the environment around space vehicles have been developed. In addition, particle-in-cell (PIC) simulation codes are being used to study plasma expansion processes, contact potentials, electron-beam plasma interactions, shocks, nonlinear wave-particle and wave-wave coupling, and several auroral plasma physics problems.

Undergraduate and graduate students are currently involved in numerous research projects in CASS that provide opportunities to program computers, analyze data, and build instrumentation. Students are encouraged to actively participate in solving research-related problems, where they can receive valuable exposure to scientific programs as well as "hands-on" experience in research while they pursue degrees. Research assistantships are available to both undergraduate and graduate students (PhD and master's level) under the direction of faculty members associated with the center. The degrees are awarded by the associated departments, including: Chemistry and Biochemistry, Electrical and Computer Engineering, Physics, and Plants, Soils, and Biometeorology.

Utah State University Research Foundation

Chairman of the Board of Trustees: Glenn Mecham

President and CEO: Bartell C. Jensen

Vice President: Doran J. Baker

Vice President: M. Kay Jeppesen

Space Dynamics Laboratory

Division Directors of the Space Dynamics Laboratory:

Systems Division: Allan J. Steed

Science Division: James C. Ulwick

Computational Sciences Division: J. Steven Hansen

Utah State University's Space Dynamics Laboratory is recognized as one of the nation's unique and vital resources in space research, conducting programs which are primarily directed toward increasing mankind's understanding of the nature of earth and space. These programs present faculty and students with unparalleled opportunities for exciting, intellectual, and hands-on engineering and science challenges in state-of-the-art space research in conjunction with their academic work.

Areas of expertise at the Space Dynamics Laboratory include conception and design of cryogenically-cooled infrared sensors; engineering of active and passive instrumentation systems for operation aboard rockets, satellites, and aircraft; calibration of space sensors; modeling of the dynamics of the planetary atmospheres; measurement of outer space phenomena; processing and analysis of spectrally- and spatially-imaged, remotely-sensed data; and cooperative around-the-globe observation programs with visiting faculty/student scientific teams at remote sites and at USU's Bear Lake Observatory.

The Space Dymanics Laboratory (SDL) is comprised of three divisions: the Systems Division, the Science Division, and the Computational Sciences Division. The divisions cooperate to fulfull the objectives of the research programs conducted at SDL.

The Systems Division is primarily an engineering, development, and applications organization for space qualified instruments, systems, and payloads. The division maintains design, fabrication, testing, calibration, and field support capabilities. Program management, subcontracting, and coordination are also important aspects of the work in the Systems Division.

The Science Division is oriented more directly to basic phenomenology research and fundamental understanding of processes. Fast-turnaround programs involving instrumented sounding rockets and science observations from remote field sites, aircraft, and balloons are the tools for gathering data to accomplish this research.

The Computational Science Division (CSD) was established to create a center for large-scale data processing and performance analysis for one of SDL's space-based sensors. CSD has since expanded its expertise into the areas of sensor simulation, image processing, data visualization and animation, high-speed scalable hardware configuration, database technology, and other areas requiring complex computer control. By seeking opportunities to address the growing need for innovative data analysis solutions, CSD hopes to meet and go beyond the state of the art in scientific computing.

The Laboratory has been very successful in generating undergraduate and graduate assistantships and in cooperative exchanges with industry, government, and educational institutions.

Technical Research Laboratory

Director: Gene L. Mortensen

The Technical Research Laboratory was created to promote Utah State University as an educational and research center. Through the auspices of the laboratory, the faculty, staff, and students of Utah State University have the opportunity of extending their educational and research expertise to serve as facilitator to private enterprise, government, and the community. Its unique relationship with Utah State University allows it to use facilities, equipment, and personnel to enter into and administer special contracts for research, educational programs, and technical and scientific services.

The laboratory assists individuals and groups at Utah State University in the development and expansion of research, instructional, and service programs supplemental to, and integrated with, the present activities of the University. It provides an outlet for faculty consulting and an opportunity for graduate and undergraduate student interface with other universities, governmental agencies, and private industry.

Areas of emphasis include testing and modeling, environmental feasibility and assessment studies, surveys, product development, manufacturing, marketing, and contracting for services.

Utah Research Institute

Director: To be appointed

Utah Research Institute (URI) is chartered as a nonprofit consortium of Utah's four major institutions of higher learning. URI identifies and mobilizes resources and implements cooperative efforts among institutions to solve technical problems for industry.

Center for Persons with Disabilities

Director: Marvin G. Fifield

Office in Center for Persons with Disabilities 120

The Utah State University-affiliated Center for Persons with Disabilities (CPD) is one of approximately 60 such centers located in major universities throughout the United States. The mission of the CPD is to improve the quality of life of persons with disabilities by (1) providing interdisciplinary training to personnel needed to provide the broad spectrum of services for individuals with disabilities; (2) demonstrating exemplary service and delivery systems, especially in rural and remote areas; (3) conducting research projects which will provide additional knowledge and application of materials, strategies, and techniques for people with developmental disabilities; and (4) providing technical assistance and training to the various service agencies to expand and improve the quality of service that they provide.

The CPD is located on the University campus in a facility constructed specifically for the program. Training and service activities are undertaken not only on campus, but in several affiliated service centers in Utah, the Navajo Reservation, and other community-based sites throughout the nation.

The faculty and staff of the CPD consist of specialists from a variety of disciplines, including special education, psychology, social work, medicine, instructional technology, early education, and vocational rehabilitation. Students come to the center from a variety of University academic departments, and the center provides supplemental coursework, research, practicum, internships, and research assistantships to prepare students to better meet the needs of individuals with disabilities.

The center reports through the College of Education and is governed by a Board of Directors appointed by the University President. The program is organized into seven divisions: Exemplary Services, Interdisciplinary Training, Outreach and Development, Biomedical Research and Service, Research and Evaluation, Technical Assistance, and Technology. The center employs approximately 240 professionals and classified employees in its many training, research, and service projects. People with disabilities (infants through adults) are served directly through home and community-based day-service programs, and training is provided to more than 600 University students each year. Over 3,000 employees of service agencies in the state and region receive in-service training through workshops and seminars provided by the CPD each year.

Major research activities include: (1) the application of technology to improve service programs; (2) early intervention research for preschool and at-risk children; (3) the effects of the immune system on Down Syndrome and autism; (4) development of staff training programs utilizing videodiscs, CD ROMs, and distance-learning technology; and (5) design and development of assistive technology devices and services.

Bureau of Research Services, College of Education

Chairman: Ron J. Thorkildsen

Office in Emma Eccles Jones Education 453

The College of Education's Bureau of Research Services (1) provides research assistance to faculty and graduate students in the College of Education, (2) assists faculty and students in locating off-campus funding for projects, (3) assists faculty and students in preparing research and other program proposals, (4) advises the dean and departments on research matters, (5) conducts faculty development workshops and symposia, and (6) represents the college on research-related committees.

Institute of Political Economy

Director: Randy T. Simmons

Administrative Director: Roberta Q. Herzberg

Office in Main 342F

The purpose of the Institute of Political Economy at Utah State University is to promote a greater understanding of the

foundations of a free society. Most of the funding is from private individuals, corporations, and foundations.

The activities are organized around three main programs—the environmental program, the health care program, and the philosophy program. The environmental program is based on the belief that property rights and targeted liability are far more effective than standard government command and control programs. Under the health care program, the Institute is organizing research programs to study health care policy and innovative programs in Utah. The Institute is also greatly involved in the public education process for health care reform. The philosophy program develops the moral and ethical considerations behind free people and free markets.

The Institute was listed on the Templeton Foundation's honor roll for 1989, as one of only three noteworthy, university-based programs.

Economics Research Institute

Director: Herbert H. Fullerton

Office in Business 504

The Economics Research Institute promotes and coordinates research on economic and related problems. The institute serves as a clearinghouse for ideas and methods related to research. Seminars and conferences stimulate faculty and student interest. Members of the Department of Economics and others who work in affiliated areas coordinate their work through the institute and receive assistance in planning research and in seeking financial support from agencies interested in their areas of research. A research study papers series is produced by the institute reporting on research, conferences, and seminars sponsored by the institute.

Ecology Center

Director: Frederic H. Wagner

Office in Natural Resources 314C

The function of the Ecology Center is to promote and coordinate research and graduate study in the science of ecology, and to provide professional ecological advice to decision makers. Its participating faculty members hold tenure in the Colleges of Agriculture, Natural Resources, and Science, and the Departments of Biology; Fisheries and Wildlife; Forest Resources; Geography and Earth Resources; Geology; Plants, Soils, and Biometeorology; and Rangeland Resources.

Development of the Ecology Center recognizes that ecology is a multidisciplinary field, requiring the coordination of biological and physical sciences. The objectives of the center are to (1) promote and support ecological research; (2) coordinate course instruction and graduate education in ecology; (3) provide an interdisciplinary focus for graduate majors in ecology; and (4) provide information and professional ecological advice for decision makers in areas affecting the environment.

About 70 faculty members actively associate with the center by participating in some aspect of ecological research or training. Although research and instruction take place in a number of states and foreign countries, the northern third of Utah provides the proximal outdoor laboratory. This includes such facilities as the Bear Lake Biological Laboratory, the USU School Forest and its supporting facilities, the Green Canyon Ecology Station, the Logan River Biology Laboratories, and the Snowville Ecology Station. It embraces a wide variety of habitat types ranging from the alpine zone to salt desert, and both aquatic and terrestrial systems.

Utah Cooperative

Fish and Wildlife Research Unit

Leader: John A. Bissonette

Assistant Leader Wildlife: Thomas C. Edwards, Jr.

Assistant Leader Fisheries: David A. Beauchamp

Office in Natural Resources 115

The Utah Cooperative Wildlife Research Unit was initiated in 1935 through a memorandum of understanding among the University, Utah Division of Wildlife Resources, Wildlife Management Institute, and the U.S. Fish and Wildlife Service and was one of the first ten wildlife units established in the U.S. The Utah Cooperative Fishery Research Unit was established at USU in December of 1961, the first of 25 such units in the United States. In December of 1984, the two units were combined through a memorandum of understanding among all cooperators. In November 1993, the unit became part of the U.S. National Biological Survey, which became the U.S. National Biological Service in January 1995. A coordinating committee, composed of representatives from the Department of Fisheries and Wildlife, U.S. National Biological Service, the Wildlife Management Institute, and Utah State Division of Wildlife Resources, provides general guidance on the research program.

The unit's objectives are to (1) conduct research basic to proper utilization of fish and wildlife resources; (2) educate graduate students in fish and wildlife ecology and management; (3) promote fish and wildlife education through demonstration, lecture, and publication; and (4) make results of investigations available to cooperators and the public by way of peer reviewed publications, reports, popular articles, and workshops.

At the present time the fishery research program emphasis is on (1) the role of predators in structuring aquatic food webs, (2) responses of fish populations to alterations of the aquatic environment, (3) behavior and habitat requirements of fish and aquatic invertebrates, and (4) threatened and endangered species.

Wildlife emphasis is in wildlife management; conservation biology; landscape ecology; responses of vertebrate populations to environmental perturbation; habitat requirements of nongame and threatened and endangered species; and conservation education. In addition to the regular cooperators, funding is obtained from other state conservation agencies, as well as from U.S. government bureaus and departments.

Institute for

Land Rehabilitation

Interim Director: John C. Malechek

Office in Natural Resources 210

The Institute for Land Rehabilitation (ILR) promotes education, research, and regional and campus-wide communication on land rehabilitation and restoration problems. The scope of the ILR includes watershed restoration and management, wetland and riparian area management, postburning rehabilitation, mined land reclamation, and other land restoration and rehabilitation activities.

The ILR works to increase interest in land restoration and rehabilitation concerns and research by University faculty and to promote the ILR as an information source to agency personnel and consultants throughout the West. To further achieve its objectives, the ILR sponsors and co-sponsors workshops, symposia, and shortcourses with regional participation.

The ILR resides in the Department of Rangeland Resources, College of Natural Resources.

USDA Forestry Sciences Laboratory

Office in Forestry Sciences Laboratory

The Forestry Sciences Laboratory is a research branch of the USDA Forest Service. At Utah State University, it is comprised of a Reclamation of Disturbed Lands Research Unit, a Mountain Pine Beetle Population Dynamics Research Unit, a Statistical Aspects of Monitoring Research Unit, personnel attached to the Forest Service Washington Office, and graduate students. A support unit containing a business manager and clerical personnel is housed at the laboratory to handle all of the business management activities.

General objectives at the laboratory are to perform research relevant to disturbed land reclamation, erosion and water quality, plant/environmental relationships, detection of ecosystem changes, and mountain pine beetle population dynamics. Specific research includes studies in hydrology, plant physiology, forest pest dynamics, cumulative watershed effects, ecological succession, revegetation, and soil and water chemistry. In addition, research includes estimation of plant, animal, and human diversity and density; study design; and power analyses.

The professional fields represented at the laboratory at Utah State University include plant physiologists, entomologists, ecologists, hydrologists, mathematical statisticians, and soil scientists.

State Arboretum at Utah State University

In 1961 the Utah State Legislature officially designated Utah State University as a state arboretum. The arboretum covers the entire campus and contains more than 3,000 trees. The arboretum also contains a collection of native and adapted plants located north of Old Main Hill and a native plant demonstration garden between the wings of the Edith Bowen Laboratory School. Various shrub species and colorful displays of bulbs, annuals, and perennials provide additional beauty as well as interest to the campus.

The campus arboretum is maintained by the Landscape Operations and Maintenance Department in cooperation with Campus Planning and Engineering. The tree removal policy states that when removals occur, trees shall be replaced on at least a one-to-one ratio to maintain the integrity of the campus forest. When a tree is removed from an established landscape area, the same species of tree shall be replanted at the removal site whenever possible to preserve the original design intent. When replacement on the same site is unfeasible, a replacement tree will be planted at another suitable campus location.

The USU campus serves as an educational resource for teaching programs of the University and the community at large. Students studying biology, horticulture, agronomy, forestry, and landscape architecture utilize the arboretum year-round to further develop a knowledge and appreciation for plants in the landscape.

Institute for Social Science Research on Natural Resources

Leader: Richard S. Krannich

Office in Main 216G

The Institute for Social Science Research on Natural Resources is a research unit established to facilitate and promote faculty and student research on a wide variety of social science research topics pertaining to the interrelations between human social systems and natural resource systems. Examples of recent and ongoing projects involving affiliated faculty and student researchers include studies of the social impacts of large-scale energy resource developments; social and cultural consequences of nuclear and hazardous waste storage; community responses to a transfer of water resources from agricultural to industrial use; social factors influencing earthquake preparedness and response; social impacts of severe sustained drought; public perceptions and attitudes toward wildlife resources; and aquatic resource education needs. Although the institute is housed within the Department of Sociology, Social Work and Anthropology, its goal is to encourage multidisciplinary research on human aspects of natural resource issues involving faculty and students from across the University.

Biotechnology Center

Director: William H. Scouten

Office in Biotechnology 105

The Biotechnology Center, created in 1986 as a Center of Excellence for the State of Utah, is a multidisciplinary unit of the Utah Agricultural Experiment Station. Its role is to support the development of biotechnology in teaching, research, and technology development and transfer. Center programs include Education and Outreach, service laboratories for biotechnology research, and support for research in agriculture, food processing and safety, animal genetics, and the environment.

Education and Outreach programs provide training and technical information to researchers, extension agents, high school teachers, government agencies, and the general public. Workshops are conducted for training in research techniques and teaching methods. Technical bulletins keep researchers abreast of new techniques and advances in biotechnology. The center offers four laboratory-intensive courses for undergraduate and graduate students. These are Methods in Biotechnology: Basic Methods; Cell Culture; Molecular Cloning; and Protein Purification.

Service laboratories provide essential biotechnology services, including DNA synthesis and sequencing, protein sequencing, peptide synthesis, monoclonal and polyclonal antibody production, immunoassay development, mammalian cell repository, fermentation, and databases for analyses.

The center also supports programs for faculty. These include grants for innovative biotechnology research projects, funding for new biotechnology faculty positions, molecular biology fellowships, and seminars.

The Biotechnology Building houses the center and research laboratories. The research laboratories are staffed by faculty and their students who are performing biotechnology research. The faculty have their academic appointments in any of the various University departments.

International Programs and Studies

Director, International Programs and Studies: Morris D. Whitaker
Associate Director: Yun Kim
Office in Military Science 216, 797-1840

Directors, International Irrigation Center: Edwin C. (Ted) Olsen and Humberto L. Yap-Salinas
Director, College of Agriculture: James H. Thomas
Director, Institute for International Rural and Community Development: Brad W. Parlin
Director, Center for International Studies: Yun Kim
Coordinator, College of Business: Gary B. Hansen
Coordinator, College of Education: Gary L. Carlston
Coordinators, College of Engineering: Alma P. Moser, Wynn R. Walker, Trevor C. Hughes
Coordinator, College of Family Life: Paul A. Savello
Coordinators, College of Humanities, Arts and Social Sciences: Yun Kim, Pamela J. Riley (coordinator for Women in Development)
Coordinators, College of Natural Resources: Charles W. Gay, Brien E. (Ben) Norton, Derrick J. Thom
Coordinator, College of Science: Scott R. Cannon
Coordinator, Merrill Library and Learning Resources Program: Kenneth E. Boutwell
Coordinator, University Extension: Weldon S. Sleight

Utah State University is one of the institutions of the federal system of land grant colleges in the United States. Much of its experience and development has made it a leader in the areas associated with arid and irrigated agriculture, forestry, range, plant, and animal science.

The University is recognized for its expertise, both nationally and internationally. In addition to its functions of teaching, research, and dissemination of information, staff members have been and are presently involved as consultants to private industry, land development corporations, fertilizer companies, private consulting firms, government agencies, and research groups, both at home and abroad.

Utah State University has a history of involvement in international programs dating back to the early 1930s. University personnel have worked in development programs in many of the developing nations of the world. In recent years Utah State University has worked in Bangladesh, Bolivia, Brazil, Cameroon, Cape Verde, Colombia, Ecuador, Egypt, El Salvador, Gambia, Honduras, Iran, Kenya, Morocco, Peru, Senegal, Somalia, Sudan, Tanzania, Upper Volta, and Venezuela. Current involvement includes: Armenia, Bolivia, China, Ecuador, Egypt, Iceland, India, Kazakhstan, Mexico, Morocco, Pakistan, Russia, and Senegal.

USAID/USU/IAV University Development Linkages Grant

Coordinator: Derrick J. Thom

In 1992, USU was awarded a five-year grant by the U.S Agency for International Development (AID) to conduct collaborative activities with the Institute for Agriculture and Veterinary Science (IAV) in Morocco. This project supports faculty and student exchanges under nine different activities. The College of Natural Resources at USU is administering this project. The Colleges of Agriculture; Engineering; and Humanities, Arts and Social Sciences are also involved, under the direction of Weldon Sleight, Wynn Walker, and David Rogers, respectively.

College of Natural Resources Study Abroad Program

Coordinator: Derrick J. Thom

The College of Natural Resources (CNR) has a study abroad program for its undergraduate students. The participating students do coursework and field work in Iceland, Mexico, or Morocco during a six-month to one-year study abroad experience. No graduate-level study abroad positions are currently available. Travel support is provided by the S. J. and Jessie E. Quinney Foundation.

USAID/USU/Egypt Software Development for Main Irrigation Systems Management

Coordinator: Wynn R. Walker

The Biological and Irrigation Engineering Department is currently under contract with USAID to develop, adapt, and verify computer software for the operation and management of the irrigation distribution system in the Nile River Valley of Egypt.

USAID/FAO/USU Foreign Participant Training

Coordinator: Lucy Ann Thompson

USU cooperates with FAO and USAID, as well as with other sponsoring agencies, to develop special academic and practical programs for foreign students nominated by these agencies.

For those foreign students who come to Utah State University under auspices of a sponsoring agency requiring Utah State University to provide administrative arrangements not provided to other students, an administrative fee is charged (currently $175 per quarter).

USAID/USU Rangeland Research for Increasing Small Ruminant Production (Bolivia—SR-CRSP)

Coordinator: Brien E. (Ben) Norton

The purpose of this project is rangeland research and training to increase productivity of llama and goats and to build scientific capabilities of researchers in Bolivia.

USDA/USU/Armenia Project

Coordinator: Weldon S. Sleight

The College of Agriculture and USU Extension Services are involved in short-term consulting in agriculture. The purpose of this project is to build Armenia's capabilities in agricultural production and marketing.

DOD/USU-SDL/Elos/Astrophysica/Russian-American Observational Satellite

Coordinator: Bartell C. Jensen

Utah State University/Space Dynamics Laboratory and two Russian agencies (Elos and Astrophysica) have begun work on the Russian-American Observational Satellite (RAMOS) program currently proposed to the U.S. Department of Defense and the Russian Ministry of Defense. RAMOS is a cooperative space experiment, initially featuring two satellites, one built and launched in Russia and the other built and launched in America.

NASA/USU-SDL/Mir Gas Analysis Project

Coordinators: Gail Bingham, Bartell C. Jensen

Utah State University and Space Dynamics Laboratory scientists are participating in the plant physiology portion of the Mir Gas Analysis Project, which is part of Russia's Spacelab Mir-1 program. These experiments are part of NASA's Closed Environment Life Support System (CELSS) program of the NASA Ames Research Center.

DOD/USU-SDL/MAI/Skipper Bow Shock Project

Coordinator: Bartell C. Jensen

Utah State University/Space Dynamics Laboratory and the Moscow Aviation Institute (MAI) are jointly developing an orbiting satellite test platform containing an ensemble of instruments capable of measuring ultraviolet and visible light. Funded by the Department of Defense/Ballistic Missile Defense Operation, the experiment's scientific objectives are to quantify the bow shock emissions and validate models of physical and chemical processes.

USAID/USU/CID/Uganda Cooperative Agreement for Makere University's Biological Field Station

Coordinator: Terry L. Sharik

The College of Natural Resources at USU, as lead university for the Consortium for International Development, has been selected to assist Makere University's Biological Field Station (BFS) at Kibale National Park to improve and manage its physical facilities and research and training opportunities. In addition, the project will develop and implement an international publicity and marketing campaign for the BFS. Partners include Lincoln University and the Missouri Botanical Gardens.

USU International Irrigation Center

Directors: Edwin C. (Ted) Olsen and Humberto L. Yap-Salinas

The Biological and Irrigation Engineering Department is engaged in an extensive program of international irrigation technology transfer and is contributing significantly to the alleviation of the world hunger problem through multi-lingual training and research in irrigation and drainage. The International Irrigation Center has been organized to provide an appropriate entity within which to sponsor these ongoing training activities.

The USU Institute for International Rural and Community Development

Director: Brad W. Parlin

The institute coordinates the international development activities of Utah State University's social sciences faculty. Its main objective is to actively participate in overseas research, extension, teaching, and curriculum development. Acting as a funding center for over two dozen development specialists, the institute is able to design, execute, evaluate, or assist international development projects from an interdisciplinary base.

Center for International Studies

Director: Yun Kim

The Center for International Studies promotes and coordinates international academic exchanges between Utah State University and the institutions of higher education abroad. The major objectives of the center are: (1) to develop bilateral university linkage programs, (2) to facilitate faculty and student exchange programs, and (3) to promote collaborative research programs, joint seminars, workshops, and conferences. The center also serves as the university academic center for international studies curriculum offerings and the Certificate Program for International Development.

Consortium for International Development (CID)

Trustees: Morris D. Whitaker and A. Bruce Bishop

Utah State University is a member of the Consortium for International Development, which was incorporated in Utah in 1972 and is a continuation of the founding organization known as CUSUSWASH, which dates back to 1967. A legal nonprofit corporation, the consortium is concerned with the orderly development of increased world food production and nutrition.

The consortium brings together the expertise of 12 universities located in the western United States. In addition to USU, member universities are: University of Arizona, California State Polytechnic University/Pomona, Colorado State University, University of Hawaii, University of Idaho, University of Montana, New Mexico State University, Oregon State University, Texas Tech University, Washington State University, and University of Wyoming.

The consortium is governed by a Board of Trustees, with two trustees appointed by the president of each member institution. The board defines policy and guidelines and has delegated the implementation and management of the consortium to an executive director, secretary/treasurer, and appropriate staff.

USU/University of Wisconsin/Euroconsult/World Bank/Bolivia Agricultural Research

Coordinator: Weldon S. Sleight

This project provides long- and short-term advisory services and training to Bolivia's agricultural research institute and extension service.

University Relations and Development

Vice President for University Relations and Development: Paul M. Norton
Office in Main 102, 797-1158

Associate Vice President for University Relations: Lee Roderick, Information News Service 105, 797-1350

Assistant to Vice President for University Relations and Development: Janet L. Appuhn, Main 108, 797-1280

Assistant to Vice President for University Relations and Development: Ronald E. Call, Heritage House, 797-1143

Good teaching, sound research, practical services performed well, and productive students and alumni are USU's chief means of public relations and development activity.

However, as a public, tax-assisted institution, the University has the responsibility of keeping the public informed as to its operation. The Office of University Relations assumes this responsibility and plans and executes a wide variety of programs and projects designed to maintain contact between the University and the various publics it serves.

USU Development Office

Executive Director: Thomas L. Allen, CFRE, 797-1320
Director of Donor Relations: Shirley C. Keyes
Director of Annual Support: Thomas A. Dyson
Director of Corporate and Foundation Development: Steven R. Morris
Director of Major Gifts: Rebecca A. Dukes, CFRE

Student tuition and fees pay only 15 percent of USU's operating budget and state support provides only 34 percent. The remainder must come from other sources. Private contributions provide a growing and very important part of the cost of providing an education of the highest quality.

USU's Development Office was established in 1967 to seek private contributions. For many years the generosity of USU's alumni and friends has vastly enhanced USU's teaching, research, and service. Contributions to Utah State University are recognized through membership in various donor clubs, including the prestigious Old Main Society.

For further information on how to establish a scholarship, endow a program, make a planned gift, join the Pooled Income Fund, or contribute real or personal property to the University, contact: **The USU Development Office, Main 101, Logan, UT 84322-1420, tel. (801) 797-1320.**

University Alumni Association

President: Cathy Montgomery
Director of Alumni Relations: G. Carlos Smith
Office in the David B. Haight Alumni Center, 797-2055, 1-800-291-2586

The Utah State University Alumni Association now numbers more than 180,000 members. This membership includes all who have attended USU for one quarter or more or who have served on the staff or faculty of the University.

Purpose: The mission of the Alumni Association is to promote the interests and welfare of Utah State University, as well as that of USU alumni, students, faculty, staff, and friends.

Government: The governance of the association is vested in the Alumni Council. The council is comprised of the president and vice president of the association, the vice president of University Relations and Development, the president of the Associated Students of USU, the president of the Emeriti, the president of the Young Alumni, the president of the Student Alumni Association, a College Alumni/Development representative, a University faculty representative, the director of Alumni Relations, the immediate past president of the association, and representatives of regional alumni chapters selected by the executive committee with the approval of the Alumni Council.

Function: The Alumni Association is the medium through which former students maintain contact with the University and are served after leaving the campus. Efforts are made to maintain a complete record of every former student throughout life, and his or her accomplishments and progress are recorded. Former students receive *Utah State University Magazine*, an official publication of USU, full of news and articles about the University. The association maintains alumni volunteers and chapter organizations throughout Utah and in major areas where former students are located. Through the association, former students are kept in contact with each other, and they meet and participate in business and social activities. They likewise assist the University with special projects in their areas.

The Alumni Association takes the leadership in sponsoring such campus events as Homecoming, Founders Day, Distinguished Service Awards, Aggie Lagoon Day, Aggie Family Day, and reunions. The association also provides opportunities for travel through the alumni travel program, and aids in athletic and other school activities.

University Information News Services

Associate Vice President for University Relations, and Director of Information News Services: Lee Roderick
Office in Information News Services 105, 797-1351

News Writer/Producer and *Staff News* Editor: Craig Hislop
Fine Arts Writer: R. Patrick Williams
Research/Science Writer: Lynnette F. Harris
Assistant Director: Clifford R. Cahoon
Editor of *Utah State University Magazine*: Jane G. Koerner
Writer/Editor: Elizabeth Walker

University Extension Information Specialist/Marketing Director: John DeVilbiss
Extension Marketing Coordinator: Julene Reese
Consumer Information Specialist: Dennis L. Hinkamp
University Editor: Linda E. Keith
Catalog Editor and Publication Specialist: Sheri E. Peterson
University Extension Service Editor: Donna Falkenborg

University Extension/Information News Services
Graphic Artist: Holly Broome-Hyer

Information News Services disseminates information daily and weekly through the press, radio, and television. It includes articles on research and news of general campus events.

Liaison between the University and the news media is maintained by this office.

Information News Services publishes *Utah State University Magazine, Impact*, and *Staff News*. *Utah State University Magazine* is devoted to reporting information about Utah State University to alumni, parents, and other friends of the institution. *Impact* is a monthly newsletter sent to Utah opinion leaders and friends of USU. *Staff News* is a weekly newsletter distributed to University employees.

Utah Public Radio

General Manager: Richard S. Meng
Program Director: Lee M. Austin
Chief Engineer: Clifford J. Smith
Office in Multimedia and Distance Learning Services 110, 797-3138

During more than 40 years of existence, Utah Public Radio has trained students in the use, operation, and human service of the radio medium. Many students go on to gain local and national renown.

Utah State University is the licensee of KUSU-FM, Utah Public Radio (UPR). Serving people throughout the state, UPR is a natural portion of a land grant institution. This broadcast station and its series of translators take the UPR signal to St. George on the south and Vernal on the east. Through informative, interesting, educational, and timely broadcasts, UPR conveys the knowledge and intellectual service of a faculty whose literary, scientific, technical, and philosophical interests comprehend much of the field of learning. Issues and ideas of local, national, and international import are actively explored, investigated, analyzed, and interpreted. The broadcasts help listeners to better understand themselves, their government, their institutions, their neighbors, and their natural and social environment. Through understanding and genuine concern, they can intelligently fulfill their obligations of citizenship and find personal satisfaction.

Nora Eccles Harrison Museum of Art

Director and Chief Curator: Steven W. Rosen, 797-0163
Education Coordinator: DeAnn Lester, 797-0166
Staff Assistant: Linda L. Pierson, 797-1414

The Nora Eccles Harrison Museum of Art is the major center for the exhibition of the visual arts in Northern Utah. Emphasizing the breadth of artistic expression and the history of art in the western United States, the Museum's permanent collections include 20th century American sculpture, ceramics, paintings, graphic arts, photographs, and American Indian arts. Selections from the collection are always on view and are rotated periodically to reflect the continuing growth and refinement of the collection. In addition to installations of its permanent holdings, the Museum organizes temporary and traveling exhibitions and serves as a venue for exhibitions of national and international stature. Artist talks, films, docent tours, and educational activities are additional dimensions of the Museum's programs which are designed to interpret, present, and foster the development of the visual arts.

As a component of Utah State University, the Museum provides educational opportunities for undergraduate and graduate students pursuing professional careers in the museum field. Through on-the-job training, independent study, and internships, students participate in collections care and management, exhibition development, installation design, and educational programming. Research and publication are also integral parts of the Museum's educational offerings, and students, along with faculty and other scholars, pursue projects which are relevant to the permanent collections and exhibitions.

Named for its benefactor, the Nora Eccles Harrison Museum was made possible through an insightful and generous gift from the Nora Eccles Treadwell Foundation. Designed by internationally acclaimed architect, Edward Larabee Barnes, the 20,000-square-foot structure includes offices, a workshop, library, storage facilities, and five exhibition galleries.

For more information, write or call: Nora Eccles Harrison Museum of Art, Utah State University, Logan, Utah 84322-4020, (801) 797-0163.

Records Management Office

Office Manager and Information Systems Specialist: Colleen M. Hobson
Office in Alumni House 209, 797-1285
Office Assistant: June McDonald
Office Assistant: Mary Draper

The Records Management Office is responsible for maintaining, providing access to, and training on the Alumni Development System (ADS System). All changes to the files and tables on the ADS system are sent to this office for input and control. All lists, mailing labels, reports, and downloads from the ADS system are prepared by this office. The Records Management Office is also responsible for maintaining, providing access to, and training for all appropriate University units on the Document Management and the Alumni Development Systems.

American West Heritage Foundation

Executive Director, Festival of the American West and Ronald V. Jensen Living Historical Farm and Museum: Ronald E. Call
Office in Heritage House, 797-1143
Assistant Director: Ronda L. Thompson
Managing Director: JoAnn Poulsen

The mission of the American West Heritage Foundation is to preserve the history, heritage, culture, art, folk life, music, and personal and social values found in the nineteenth century, to effect facilities, environments, and programs of preservation, recreation, and education. After years of nurturing, the Festival of the American West and the Ronald V. Jensen Living Historical Farm and Museum were merged into the American West Heritage Foundation. The foundation administers the operation and growth of these two award-winning programs involved in historical preservation, education, economic development, and heritage tourism. By providing internships and scholarship programs centered around cultural heritage, the foundation fosters programs beneficial to the University.

University Publications Editors

University Editor, Editorial Services: Linda E. Keith
University Catalogs Editor and Publication Specialist, Editorial Services: Sheri E. Peterson

Extension Publications Editor: Donna Falkenborg
Agricultural Experiment Station Editor: Kurt W. Gutknecht
USU Press and Scholarly Publications Editor: John R. Alley, Jr.
Assistant Athletic Director—Media Relations: John G. Lewandowski
***Utah State University Magazine* Editor:** Jane G. Koerner
***Staff News* Editor:** Craig Hislop
***The Utah Statesman* Adviser**: Jay C. Wamsley
***USU and YOU*, (School Relations) Editor:** Mark Tenhoeve
***Utah State Biotechnology* and *Biotechnology News* Editor:** John T. Lohr
Utah Water Research Laboratory Editor: Leaunda S. Hemphill
Space Dynamics Laboratory, Systems Division Senior Editor: Glenn D. Allred
Continuing Education Director of Marketing: Gary S. Poppleton

College of Agriculture

***Newsline* (college alumni newsletter) Coordinator:** Robin C. Scherting
***Western Center for Dairy Protein Research and Technology Newsletter* Editor:** Carl Brothersen
***Perspectives* (Department of Economics alumni newsletter) Editor:** Ruby L. Vazquez

College of Business

Partners Program Editor: Alta Markeson
***Perspectives* (Department of Economics alumni newsletter) Editor:** Ruby L. Vazquez
***School of Accountancy Newsletter* (alumni) Editor:** Clifford R. Skousen
***Information Systems Educator* (BISE alumni/professional newsletter) Co-editors:** Susan M. Richards, Marianna Larsen

College of Education

***Using What We Know: Research Into Practice* (Bureau of Research Services) Co-editors:** Ron J. Thorkildsen, Melanie Stein
Center for Persons with Disabilities Information Specialist: Kelleen S. Hambly
Communicative Disorders Publication Specialist/Editor/ Instructional Designer: Mary Ann Parlin

College of Engineering

***The Signal* (Department of Electrical and Computer Engineering alumni newsletter) Editor:** Charles M. Swenson

College of Family Life

***Family Life* (college alumni newsletter) Editor:** Jill C. Windley
***Themis: Journal of Theory in Home Economics* Editor:** Joan R. McFadden
***Dietetics Newsletter* (dietetics graduates) Editor:** Noreen B. Schvaneveldt
***Western Center for Dairy Protein Research and Technology Newsletter* Editor:** Carl Brothersen

College of Humanities, Arts and Social Sciences

***HASS Connections* (college alumni newsletter) Editor:** Sydney M. Peterson
***Western American Literature* Editor:** Thomas J. Lyon
***Western Historical Quarterly* Co-editors:** Clyde A. Milner, II, Anne M. Butler
***Insites* (LAEP alumni newsletter) Adviser:** Michael Lee Timmons
***Utah State Theatre Alumni Newsletter* Editor:** Mike Humberstone
***Eighteenth-Century Studies* Editor:** Jeffrey Smitten
***Hands On Language* (Pacific Northwest Council for Foreign Languages) Editor:** Alfred N. Smith, Jr.
***Ploutarchos* Editor:** Frances B. Titchener

College of Natural Resources

***Resource Lines* (alumni newsletter) Editor:** Mary Lu Roskelley
***Society and Natural Resources* Editor:** James J. Kennedy
***Western Journal of Applied Forestry* Editor:** Ronald M. Lanner
***Utah Geographic Alliance Newsletter* Editor:** Clifford B. Craig

College of Science

***Insights* (alumni newsletter) and *Science Scene* Editor:** Colette D. Yates

Affirmative Action/Equal Opportunity Office

Director: Sue Guenter-Schlesinger
Office in Merrill Library 390, 797-1266

It is the policy of Utah State University to ensure equal educational and employment opportunity regardless of race, religion, age, national origin, sex, disability, or veteran status. In addition, discrimination based on sexual orientation is prohibited in evaluating employee or student performance. The Affirmative Action/Equal Opportunity (AA/EO) Office implements federal anti-discrimination laws and strives to provide an atmosphere in which students, staff, and faculty can work, study, and live without the fear of discrimination or sexual harassment. It also works to increase access to education and employment for groups who have traditionally faced barriers to opportunities in these areas. With this in mind, the AA/EO Office focuses on a variety of areas, including:

1. Monitoring and developing affirmative action policies, plans, and programs at USU which are aimed at increasing participation in employment and educational programs of underrepresented groups, to include women, ethnic minorities, veterans, and people with disabilities;

2. Investigating, processing, and resolving discrimination and sexual harassment complaints. Federal law prohibits retaliation

against individuals who file discrimination or sexual harassment complaints;

3. Enhancing awareness of and sensitivity toward ethnic, cultural, and gender differences;

4. Providing training on affirmative action/equal opportunity laws and the prevention of sexual harassment;

5. Monitoring the representation of underrepresented groups among students, faculty, and staff.

Utah State University is dedicated to providing equal opportunity in education and employment to all students, faculty, and staff. University members who feel their rights have been violated, want information, or just need some guidance relating to their course of action, should contact the Affirmative Action/Equal Opportunity Office, located in room 390 of the Merrill Library, or call 797-1266. Copies of the complete Affirmative Action Plan and the AA/EO Grievance Procedure are available in the AA/EO Office.

National Honor Societies with Chapters at USU

Alpha Lambda Delta Honor Society

Alpha Lambda Delta (ALD) honors academic excellence during a student's first year in college. Founded at the University of Illinois in 1924, ALD encourages superior academic achievement and promotes intelligent living and a continued high standard of learning.

Students invited to join ALD must have achieved a 3.5 or better grade point average their first quarter at USU. The chapter membership drive is conducted winter quarter.

Chapter Adviser: Carol A. Rosenthal, life skills coordinator, Learning and Life Skills Center, 797-4027.

Golden Key

Founded at Georgia State University in 1977, this academic honors organization recognizes and encourages scholastic achievement among students from all academic fields. The society unites talented undergraduate students with prominent faculty members and administrators who are active in Golden Key at the chapter and national levels. Two scholarships are awarded annually by each chapter to outstanding junior and senior initiates.

Membership, by invitation only, is limited to no more than the top 15 percent of juniors and seniors enrolled at USU. Part-time and full-time students qualify, as do traditional and nontraditional students.

Chapter Adviser: Donna E. Crow, director of co-op education, Career Services and Cooperative Education, 797-3588.

Phi Kappa Phi

Membership in this national organization is based upon academic achievement and is proffered to undergraduate and graduate students who obtain a grade point average in the highest 10 percent of those graduating from each college.

Chapter Advisers: Charles M. Lutz, president (associate professor of Business Information Systems and Education), 797-2349; and Maureen Wagner, vice president (academic services adviser, College of Natural Resources), 797-2448.

Pinnacle

Pinnacle is a national honor society for undergraduate reentry students. Initiates must be 25 years of age or older, must have had at least a five-year gap in their educations, must have at least a 3.0 overall GPA at USU, and must be involved in campus or community activities. Membership is open to last-quarter juniors and seniors who will be graduating within two academic years. Applications are available in February and due in early March.

Chapter Adviser: Janet L. Osborne, director, Women's Center/Reentry Student Center, 797-1728.

Mortar Board

Members of this senior honor society function under the code: Scholars—Chosen for Leadership—United To Serve.

Students must have at least a 3.2 GPA and must submit an application. New members are chosen during the last quarter of their junior year.

Chapter Adviser: Travis Morgan, assistant director, Student Activities, 797-1740.

Utah State Board of Regents

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Assistant Vice President for Extension and Dean, Continuing Education:	Rex L. Tueller
Dean of Learning Resources:	Glenn R. Wilde

Colleges

Agriculture; Rodney J. Brown, Dean; Agricultural Science 223; UMC 4800; 797-2215
Business; David B. Stephens, Dean; Business 212/202; UMC 3500; 797-2272
Education; Izar A. Martinez, Dean; Education 109; UMC 2800; 797-1437
Engineering; A. Bruce Bishop, Dean; Engineering Class 110; UMC 4100; 797-2775
Family Life; Bonita W. Wyse, Dean; Family Life 203B; UMC 2900; 797-1536
Humanities, Arts and Social Sciences; Brian L. Pitcher, Dean; Library 216; UMC 0700; 797-1195
Natural Resources; Joseph A. Chapman, Dean; Natural Resources 108; UMC 5200; 797-2445
Science; James A. MacMahon, Dean; Science Engineering Research 101; UMC 4400; 797-2478

School of Graduate Studies; James P. Shaver, Dean; Computer Center 108; UMC 0900; 797-1191
Learning Resources; Glenn R. Wilde, Dean; Library 414; UMC 3000; 797-1201
Continuing Education; Rex L. Tueller, Dean; Eccles Conference Center 101; UMC 5000; 797-2134

Departments of Instruction

Accountancy, School of; Clifford R. Skousen, Head; Business 511; UMC 3540; 797-2330
Aerospace Studies; Lt. Colonel Ken Peterson, Head; Military Science 107; UMC 9590; 797-8723
Agricultural Systems Technology and Education; Gary S. Straquadine, Head; Agricultural Systems Technology and Education 101; UMC 2300; 797-2230
Animal, Dairy and Veterinary Sciences; Robert C. Lamb, Head; Agricultural Science 232; UMC 4815; 797-2162
Art; Marion R. Hyde, Head; Fine Arts Visual 120; UMC 4000; 797-3460
Biological and Irrigation Engineering; Wynn R. Walker, Head; Engineering Class 216; UMC 4105; 797-2785
Biology; Edmund D. Brodie, Jr., Head; Biology-Natural Resources 123; UMC 5305; 797-2485
Business Administration; Philip R. Swensen, Head; Business 811; UMC 3510; 797-2362
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Chemistry and Biochemistry; Vernon D. Parker, Head; Maeser Laboratory 106; UMC 0300; 797-1619
Civil and Environmental Engineering; Loren R. Anderson, Head; Engineering Laboratory 211; UMC 4110; 797-2932
Communication; Edward C. Pease, Head; Animal Science 310; UMC 4605; 797-3292
Communicative Disorders and Deaf Education; Thomas S. Johnson, Head; Communicative Disorders 102C; UMC 1000; 797-1375
Computer Science; Donald H. Cooley, Head; Main 414; UMC 4205; 797-2451
Economics; Donald L. Snyder, Head; Business 615; UMC 3530; 797-2310
Electrical and Computer Engineering; Richard W. Harris, Head; Engineering Laboratory 149; UMC 4120; 797-2840
Elementary Education; Jay A. Monson, Head; Education 385A; UMC 2805; 797-0385
English; Jeffrey Smitten, Head; Ray B. West 201; UMC 3200; 797-2733
Family and Human Development; Brent C. Miller, Head; Family Life 211; UMC 2905; 797-1501
Fisheries and Wildlife; Raymond D. Dueser, Head; Natural Resources 206; UMC 5210; 797-2459
Forest Resources; Terry L. Sharik, Head; Natural Resources 208; UMC 5215; 797-3219
Geography and Earth Resources; Allan Falconer, Head; Natural Resources 201; UMC 5240; 797-1790
Geology; Donald W. Fiesinger, Head; Geology 205; UMC 4505; 797-1273
Health, Physical Education and Recreation; Robert E. Sorenson, Head; Physical Education 122; UMC 7000; 797-1495
History; Norman L. Jones, Head; Main 323; UMC 0710; 797-1290
Human Environments; Joan R. McFadden, Head; Family Life 303; UMC 2910; 797-1558
Industrial Technology and Education; Maurice G. Thomas, Head; Industrial Science 112E; UMC 6000; 797-1795
Instructional Technology; Don C. Smellie, Head; Education 215; UMC 2830; 797-2694
Intensive English Language Institute; Franklin I. Bacheller, Director; Main 202; UMC 0715; 797-2081
Landscape Architecture and Environmental Planning; Richard E. Toth, Head; Fine Arts Visual 230; UMC 4005; 797-0500
Languages and Philosophy; Kent E. Robson, Head; Main 204; UMC 0720; 797-1209
Management and Human Resources; John R. Cragun, Head; Business 411; UMC 3555; 797-2787
Mathematics and Statistics; Jerry Ridenhour, Head; Lund Hall 211; UMC 3900; 797-0244
Mechanical and Aerospace Engineering; Frank J. Redd, Head; Engineering Laboratory 176; UMC 4130; 797-2867
Military Science; Major Patrick J. Malherek, Head; Military Science 104; UMC 9595; 797-0609
Music; Bruce M. Saperston, Head; Fine Arts Visual 129; UMC 4015; 797-3000
Nutrition and Food Sciences; Ann W. Sorenson, Head; Nutrition and Food Sciences 213; UMC 8700; 797-2126
Physics; W. John Raitt, Head; Science Engineering Research 250A; UMC 4415; 797-2857

Plants, Soils, and Biometeorology; V. Philip Rasmussen, Head; Agricultural Science 322-C; UMC 4820; 797-2233
Political Science; Randy T. Simmons, Head; Main 320A; UMC 0725; 797-1306
Psychology; David M. Stein, Acting Head; Education 487; UMC 2810; 797-1460
Rangeland Resources; John C. Malechek, Head; Natural Resources 210; UMC 5230; 797-2471
Secondary Education; William J. Strong, Head; Education 330; UMC 2815; 797-2222
Sociology, Social Work and Anthropology; Gary H. Kiger, Head; Main 224; UMC 0730; 797-1230
Special Education and Rehabilitation; Charles L. Salzberg, Head; Education 313A; UMC 2865; 797-3243
Theatre Arts; Sid G. Perkes, Head; Fine Arts 232; UMC 4025; 797-3046
Watershed Science (College of Natural Resources Interdepartmental Program); John A. Kadlec, Director; Natural Resources 355; UMC 5200; 797-2461

Cooperative Nursing Program; Operated under College of Science in cooperation with Weber State University; Pamela E. Hugie, Coordinator; Lundberg Building 201; UMC 2600; 797-1515

Student Services

Academic Service Center; Student Center 302; UMC 0120; 797-1128
Admissions; Student Center 246; UMC 1600; 797-1079
Career Services and Cooperative Education; University Inn 102; UMC 4305; 797-7777
Career Exploration Programs; University Inn 101; UMC 0110; 797-1138
Counseling Center; Student Center 306; UMC 0115; 797-1012
Disability Resource Center; Student Center 104; UMC 0101; 797-2444
Enrollment Services; Student Center 246; UMC 1600; 797-1107
Financial Aid Office; Student Center 106; UMC 1800; 797-0173
General Registration, Division of; Student Center 302; UMC 0120; 797-3373
Graduation Office; Student Center 246; UMC 1600; 797-1112
High School/College Relations; University Inn 101; UMC 0160; 797-1129
Housing; Housing Office; UMC 8600; 797-3113
International Students and Scholars Office; Student Center 313; UMC 0140; 797-1124
Learning and Life Skills Center; Student Center 302; UMC 0120; 797-1132
Multicultural Student Affairs; Student Center 311K; UMC 0175; 797-1733
Parking and Transportation Services; Parking and Transportation Services; UMC 7100; 797-3414
Records; Student Center 246; UMC 1600; 797-1116
Registration; Student Center 246; UMC 1600; 797-1101
Student Health Services; Student Center 102; UMC 0170; 797-1660
Substance Abuse Prevention/Education; University Inn 127; UMC 0111; 797-1010
Testing Services; University Inn 115; UMC 0118; 797-1004
Veterans Affairs; Student Center 246; UMC 1600; 797-1102
Women's Center/Reentry Student Center; Student Center 310; UMC 0185; 797-1728

Notes: The area code for all phone numbers listed above is 801. To dial a number with a "797" prefix from an on-campus telephone, dial "7," followed by the last four digits of the telephone number. The four-digit UMC (University Mail Code) number should be added to the University zip code (84322) to make a nine-digit zip code on mail coming from off-campus. (Example: Political Science Department, Utah State University, Logan, UT 84322-0725.)

Faculty and Professional Staff

ABENDROTH-SMITH, JULIANNE (1993) Asst. Prof., Health, Physical Education and Recreation. BS 1985 University of Colorado, MS 1988 University of Oregon, EdD 1993 University of Northern Colorado.

ABBOTT, BEN A. (1995) Asst. Prof., Electrical and Computer Engineering. BS 1983 Texas Tech University, MS 1989, PhD 1994 Vanderbilt University.

ADAMSON, KATHLEEN A. (1975, 1979) Asst. Director, Career Services and Cooperative Education. BS 1965 University of Utah, MS 1987 Utah State University.

ADDLEY, CRAIG R. (1994) Research Engineer, Utah Water Research Laboratory. BS 1989, MS 1993 Utah State University.

ADKINS, DAN F. (1993) Adjunct Asst. Prof., Civil and Environmental Engineering. BS 1982, MS 1983, PhD 1990 Utah State University.

AFLATOONI, KIAN (1987) Adjunct Asst. Prof., Civil and Environmental Engineering. BS 1979, MS 1981 University of Nebraska.

AGRAN, MARTIN (1982) Prof., Special Education and Rehabilitation. BA 1969 City College of New York, MA 1971 University of Rochester, MS 1976 Western Oregon State College, PhD 1984 University of Illinois.

AHLSTROM, C. BLYTHE (1964, 1979) Asst. Provost, Provost's Office; Adjunct Asst. Prof., History. BS 1958, MS 1961 Columbia University.

AIRD, STEVEN DOUGLAS (1992) Adjunct Asst. Prof., Biology. BS 1974 Montana State University, MS 1977 Northern Arizona University, PhD 1983 Colorado State University.

AKERS, JAMES F. (1995) Research Associate, Center for Persons with Disabilities. BS 1970 University of Southern California (Los Angeles), MS 1992 Utah State University.

ALBRECHTSEN, RULON S. (1969) Prof., Plants, Soils, and Biometeorology. BS 1956, MS 1957 Utah State University, PhD 1965 Purdue University.

ALBRETSEN, JAY C. (1992) Veterinarian, Animal, Dairy and Veterinary Sciences. BS 1984 Utah State University, DVM 1988 Purdue University.

ALDEN, MERIDITH (1985) Adjunct Prof., Psychology. BA 1971 University of North Carolina, PhD 1976 University of Tennessee, MD 1979 Duke University.

ALDER, JEAN M. (1970) Ext. Assoc. Prof. and Home Economics Agent, University Extension; Adjunct Assoc. Prof., Human Environments. BEd 1964 University of Alaska, MS 1967 Utah State University.

ALDONS, ADRIENNE (1988) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1986 University of Utah, MS 1988 Case Western Reserve University.

ALEXANDER, VIRGINIA (1995) Head Volleyball Coach, Intercollegiate Athletics. BS 1986 University of Alabama (Birmingham), MS 1992 Bowling Green State University.

ALLAN, STEPHEN J. (1986) Assoc. Prof., Computer Science. BS 1973 Utah State University, MS 1976, PhD 1979 Iowa State University.

ALLAN, VICKI H. (1986) Assoc. Prof., Computer Science. BS 1973 Utah State University, MS 1984, PhD 1986 Colorado State University.

ALLEN, DELL K. (1994) Adjunct Prof., Mechanical and Aerospace Engineering. BS 1954 Utah State University, MS 1967 Brigham Young University, EdD 1973 Utah State University.

ALLEN, ELIZABETH W. (1989) Assoc. Registrar, Enrollment Services.

ALLEN, MICHAEL FRED (1988) Adjunct Asst. Prof., Biology. BS 1974 Southwestern College, MS 1977, PhD 1980 University of Wyoming.

ALLEN, RICHARD G. (1985) Assoc. Prof., Biological and Irrigation Engineering. BS 1974 Iowa State University, MS 1977, PhD 1984 University of Idaho.

ALLEN, RICKEY GENE (1979) Director of Accounting and Financial Reporting, Controllers Office. BS 1974 Utah State University.

ALLEN, STANLEY D. (1979) Prof., Animal, Dairy and Veterinary Sciences; Chairman, Committee on Experimental Animals. BS 1967 Utah State University, DVM 1971 Iowa State University.

ALLEN, THOMAS L. (1987) Program Consultant to the Mountain West Center for Regional Studies, History; Executive Director, Institutional Development. BJ 1969 University of Missouri.

ALLEY, JOHN R., Jr. (1990) Editor, USU Press and Scholarly Publications. BA 1975, MA 1978 University of Utah, PhD 1986 University of California (Santa Barbara).

ALLGOOD, SCOT M. (1992) Asst. Prof., Family and Human Development. BS 1983 Weber State College, MS 1985 Montana State University, PhD 1988 Brigham Young University.

ALLRED, DOUGLAS M. (1990) Specialist, Center for Persons with Disabilities. BS 1984, MS 1988 Utah State University.

ALLRED, GLENN D. (1970) Managing Editor, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BFA 1968 University of Utah.

ALLRED, LLOYD G. (1993) Adjunct Assoc. Prof., Electrical and Computer Engineering. BS 1967 Utah State University, MS 1971, PhD 1973 University of Utah.

ALLRED, MICHAEL D. (1990) Ext. Instr. and Cache County Agent (Water Quality), University Extension. BS 1990 Utah State University.

ALMOND, LISA (1990) Faculty Assistant (Music Therapy), Music. BS 1989 Utah State University.

AL-RASHID, NAZIH T. (1988) Director, Student Support Services; Adjunct Asst. Prof., Sociology, Social Work and Anthropology. BA 1965 Baghdad University, MS 1979, PhD 1984 Utah State University.

ALSOP, LINDA (1992) Program Coordinator, Communicative Disorders and Deaf Education. BS 1972 University of Utah, MEd 1988 Utah State University.

ALSOP, TED J. (1984) Assoc. Prof., Geography and Earth Resources. BS 1973, MS 1976 University of Utah, PhD 1980 Oregon State University.

ALSTON, DIANE G. (1989) Assoc. Prof. and Ext. Specialist (Entomology), Biology. BS 1982 University of California (Riverside), MS 1985, PhD 1989 North Carolina State University.

ALTHOUSE, RICHARD BRAD (1987) Knowledge Engineer, Center for Persons with Disabilities; Adjunct Instr., Computer Science. BS 1981, BS 1982 Pennsylvania State University, MS 1986 Utah State University.

ALTOP, R. CRAIG (1993) Research Associate and Director of LEMA, Geography and Earth Resources. BS 1978 California State University (Sacramento).

ALVORD, JACK RAY (1987) Adjunct Assoc. Prof., Psychology. BA 1966 University of Missouri, MS 1968, PhD 1969 Utah State University.

AMANO, GARY (1975) Asst. Dept. Head and Prof., Music. BS 1971, MA 1972 Julliard School of Music.

AMES, SUSAN (1991) Faculty Assistant (Vocal), Music.

AMUNDSEN, DEBBIE (1993) Asst. Director and Horticulturist, USU Botanical Gardens, Plants, Soils, and Biometeorology. BS 1981 Utah State University.

ABENDROTH-SMITH, JULIANNE (1993) Asst. Prof., Health, Physical Education and Recreation. BS 1985 University of Colorado, MS 1988 University of Oregon, EdD 1993 University of Northern Colorado.

ANDERSON, ALAN (1989) Specialist, Auxilliary Enterprises, Administrative Affairs.

ANDERSON, ANNE J. (1979) Prof., Biology. BS 1967 Bedford College, PhD 1979 University of Leicester.

ANDERSON, BRIAN J. (1992) Manager, Facilities Operations, Physical Plant. BS 1990, MBA 1991 Utah State University.

ANDERSON, DAVID (1995) Landscape Planner/Coordinator, Plants, Soils, and Biometeorology. BS 1990 Brigham Young University, MS 1994 Utah State University.

ANDERSON, DAVID M. "ANDY" (1983) Principal Lecturer, Biology. BA 1971 University of Pacific, MS 1975 Iowa State University, PhD 1983 Creighton University.

ANDERSON, GARY L. (1983) Ext. Asst. Prof. and Sanpete County Agent (Agriculture), University Extension. BS 1971 Utah State University.

ANDERSON, IAN MacDONALD (1979) Prof., Mathematics and Statistics. MMath 1974 University of Waterloo (Ontario), PhD 1976 University of Arizona.

ANDERSON, J. LAMAR (1961) Prof., Plants, Soils, and Biometeorology. BS 1955 Utah State University, PhD 1961 University of Wisconsin.

ANDERSON, JANET B. (1988) Clinical Asst. Prof., Nutrition and Food Sciences. BS 1983, MS 1988 Utah State University.

ANDERSON, JANET ELAINE ALM (1986) Assoc. Librarian, Library Services, Learning Resources Program; Adjunct Asst. Prof., Forest Resources. BS 1975 Bemidji State University, MA 1981, MSLS 1982 Western Kentucky University, PhD 1994 Utah State University.

ANDERSON, JAY (1985) Prof., History and English. BA 1963 Hamilton College, MA 1969, PhD 1971 University of Pennsylvania.

ANDERSON, JON I. (1964) Prof., Art. BPA 1955 Art Center School, MFA 1968 Utah State University.

ANDERSON, LISA BROWN (1991) Administrative Assistant, Conference and Institute Division, Continuing Education. BS 1990 Utah State University.

ANDERSON, LOREN RUNAR (1974) Dept. Head and Prof., Civil and Environmental Engineering. BS 1964, PhD 1972 Utah State University, PE.

ANDERSON, LUELLA F. (1991) Asst. Prof., Human Environments. BS 1967 Iowa State University, MS 1973 Texas Tech University, PhD 1993 Iowa State University.

ANDERSON, STEVEN D. (1995) Asst. Prof., Communication. BA 1978 St. Cloud State University, MA 1985, PhD 1989 University of Denver.

ANDRA, THEODORE (1961) Assoc. Prof. and Director of Undergraduate Studies, English. BS 1961, MA 1963 Utah State University, DA 1973 University of Oregon.

ANDREWS, CARRIE M. (1995) Hall Director, Housing Services, Auxiliary Enterprises. BS 1995 Utah State University.

ANDRUS, J. MILO (1985) Adjunct Prof., Psychology. BS 1965 Stanford University, MD 1970 George Washington Medical School.

ANGELOS, KATHERINE (1995) Director—Development, College of Science. BS 1984 University of Utah.

APPUHN, JANET L. (1989) Asst. to Vice President for University Relations and Development. BS 1969, MS 1973 Southern Illinois University.

ARAVE, CLIVE WENDELL (1965) Prof., Animal, Dairy and Veterinary Sciences. BS 1956, MS 1957 Utah State University, PhD 1963 University of California (Davis).

ARBUTHNOT, JEANETTE J. (1988) Asst. Prof., Human Environments. BS 1980 Florida International University, MS 1984 Colorado State University, PhD 1990 Oklahoma State University.

ARMSTRONG, ELLIS L. (1976) Adjunct Prof., Civil and Environmental Engineering. BS 1936 Utah State University, PhD (honorary) Southern Utah State College and Newark College of Engineering.

ARMSTRONG, VAHN (1987) Adjunct Assoc. Prof., Music. BS 1979, MS 1982 Juilliard School of Music.

ARTZ, SUSAN G. FRIEDMAN (1993) Adjunct Asst. Prof., Special Education and Rehabilitation. BA 1975 New England College, MEd 1980 Plymouth State College, PhD 1984 Utah State University.

ASCIONE, DEBORAH B. (1991) Lecturer, Family and Human Development. BA 1969 Dunbarton College, MS 1990 Utah State University.

ASCIONE, FRANK R. (1973) Prof., Psychology and Center for Persons with Disabilities; Adjunct Prof., Family and Human Development. BS 1969 Georgetown University, PhD 1973 University of North Carolina.

ASHBAKER, BETTY (1993) Specialist, Center for Persons with Disabilities. BS 1972, MS 1974 Utah State University, PhD 1982 Brigham Young University.

ASHURST, CHARLES A. (1987) Electrical Engineer, Rangeland Resources. BS 1980 Utah State University.

ASPAAS, HELEN RUTH (1992) Asst. Prof., Geography and Earth Resources. BA 1972 Fort Lewis College, MA 1986 University of Nebraska (Lincoln), PhD 1992 University of Colorado (Boulder).

ASTON, D. CRAIG (1983) Lecturer, Plants, Soils, and Biometeorology. BS 1981, MS 1982 Utah State University.

ATKIN, THOMAS E. (1986) Adjunct Asst. Prof., Psychology. BA 1976, MS 1980 Utah State University, PsyD 1985 Indiana State University.

ATWOOD, CHERYL C. (1984) Adjunct Clinical Lecturer, Biology. AD 1974 Weber State College.

AUST, ANN E. (1987) Assoc. Prof., Chemistry and Biochemistry. BS 1970 University of Houston, PhD 1975 Michigan State University.

AUST, STEVEN D. (1987) Director, Biotechnology Center; Prof., Chemistry and Biochemistry, Nutrition and Food Sciences. BS 1960, MS 1962 Washington State University, PhD 1965 University of Illinois.

AUSTIN, ANN M. BERGHOUT (1980) Asst. Dean for Academic Affairs, College of Family Life; Prof., Family and Human Development; Adjunct Prof., Psychology; Adjunct Prof., Human Environments. BS 1971, MS 1977 Utah State University, PhD 1981 Iowa State University.

AUSTIN, LEE M. (1980) Program Director, KUSU-FM (Utah Public Radio). BS 1978 University of Wisconsin (Oshkosh).

AUSTIN, LLOYD HALE (1985) Adjunct Assoc. Prof., Civil and Environmental Engineering. BS 1967, MS 1970 Utah State University.

AUTRY, JOANN R. (1987) Director, Office of Substance Abuse Prevention/Education. BS 1992 Utah State University.

AVERETT, KELLY B. (1994) Internal Auditor, Internal Audits. BS 1990, MAcct 1991 Utah State University.

BABCOCK, WARREN EUGENE (1981) Senior Librarian, Librarian-Reference, Merrill Library and Learning Resources Program. BA 1966, MLS 1968 Brigham Young University, MA 1972 Washington State University.

BACHELLER, FRANKLIN I. (1987) Director and Principal Lecturer, Intensive English Language Institute. BA 1965 University of Wisconsin, MA 1977 Southern Illinois University.

BACHMANN, ROSE MARIE A. (1979) Secretary to President, President's Office. BA 1970 Utah State University.

BAER, RICHARD D. (1976) Director—Outreach, Center for Persons with Disabilities; Lecturer, Special Education and Rehabilitation; Adjunct Asst. Prof., Psychology. BS 1968 Towson State College, MS 1975, PhD 1978 Utah State University.

BAGLEY, CALVIN F. (1994) Adjunct Research Associate, Rangeland Resources. BS 1984, MS 1987 Utah State University.

BAGLEY, CLELL V. (1975) Prof., Animal, Dairy and Veterinary Sciences; Veterinarian, University Extension. BS 1965 Utah State University, DVM 1968 Colorado State University.

BAGLEY, RANDALL TODD (1986) Supervisor, Dairy Products Laboratory, Nutrition and Food Sciences. BS 1986 Utah State University.

BAGLEY, ROYAL A. (1974) Adjunct Research Prof., Animal, Dairy and Veterinary Sciences. BS 1948, MS 1949 Utah State University, DVM 1953 Colorado State University.

BAGLEY, VERL L. (1974) Ext. Assoc. Prof. and Wayne County and Piute County Agent, University Extension. BS 1969 Southern Utah State College, MS 1980 Utah State University.

BAILEY, DeeVON (1983) Prof. and Ext. Specialist, Economics. BA 1979, MA 1980 Utah State University, PhD 1983 Texas A&M University.

BAILEY, JODI (1994) Internal Auditor, Internal Audits. BS 1990, MS 1991 Weber State University, CPA 1992.

BAILEY, JOHN CHARLES (1982) Adjunct Assoc. Prof., Biology. BS 1967, MD 1970, MSCM 1976 University of Utah.

BAILEY, LON S. (1992) Job Locator, Career Services and Cooperative Education. BS 1966 Utah State University, MS 1976 University of Utah.

BAKER, DALE C. (1986) Adjunct Research Prof., Animal, Dairy and Veterinary Sciences. DVM 1973, PhD 1977 Colorado State University.

BAKER, DORAN J. (1959) Prof., Electrical and Computer Engineering; Adjunct Prof., History; Vice President, Utah State University Research Foundation. BS 1953, PhD 1956 University of Utah.

BAKER, FREDERICK ANTHONY, Jr. (1984) Assoc. Prof., Forest Resources. BS 1975, PhD 1981 University of Minnesota.

BAKER, KATHY R. (1987) Executive Assistant, Space Dynamics Laboratory, USU Research Foundation.

BAKER, KAY D. (1969) Prof., Electrical and Computer Engineering and Physics; Assoc. Director, Science Division, Space Dynamics Laboratory, USU Research Foundation. BA 1956, MS 1957, PhD 1966 University of Utah.

BAKKER, JAN (1977) Prof., English. BA 1958, MA 1961 University of Virginia, PhD 1975 University of Tennessee. Sabb. 1995-96 academic year.

BALDWIN, JUDY (1981) Administrative Nurse, Student Health Services. LPN 1963 Utah Trade Tech.

BALDWIN, MELVIN PAUL (1983) Supervisor, Business Office, Physical Plant.

BALLAM, MICHAEL L. (1987) Prof., Music. BA 1972 Utah State University, MM 1974, DM 1976 Indiana University. Sabb. 1995-96 academic year.

BALLANTYNE, JUDITH M. (1986) Adjunct Asst. Prof., Geology. BS 1970 University of Canterbury (New Zealand), PhD 1981 University of Utah.

BALLARD, JAY CLYNN (1986) Research Technologist, Systems Division, Space Dynamics Laboratory, USU Research Foundation.

BALLOW, R. BRENT (1991) Adjunct Assoc. Prof., Communication. BS 1982 Centre College of Kentucky, MBA 1985 University of Tennessee, Law Degree 1988 Vanderbilt University School of Law.

BALPH, MARTHA HATCH (1984) Research Assoc. Prof., Fisheries and Wildlife. BA 1965 Wellesley College, MS 1969 University of Wyoming, PhD 1975 Utah State University.

BAME, JAMES E. (1990) Senior Lecturer, Intensive English Language Institute. BS 1970 Ashland College, MA 1983 San Francisco University.

BANKS, JEFFREY E. (1979) Ext. Assoc. Prof. and Juab County Agent, University Extension. BS 1979 Utah State University, MS 1982 Utah State University.

BANKS, STERLING J. (1981) Ext. Assoc. Prof. and Summit County Agent (Agriculture), University Extension. BS 1981 Utah State University, MS 1984 Utah State University.

BANNER, ROGER E. (1983) Assoc. Prof., Rangeland Resources; Range Management Specialist, University Extension. BS 1967 Texas Technological College, MS 1969 New Mexico State University, PhD 1981 Utah State University.

BARAKAT, ABDALLAH R. (1982) Research Assoc. Prof., Center for Atmospheric and Space Sciences, Physics. BS 1972, MS 1978 Alexandria, Egypt, PhD 1982 Utah State University.

BARCLAY, ROBERT DALE (1987) Asst. Attorney General, Assigned as General Counsel to Utah State University, President's Office. BS 1970 Weber State College, JD 1976 University of Oklahoma.

BARCUS, CAROLYN G. (1986) Clinical Asst. Prof., Psychology; Director, Utah Division, UCAN Consortium. BS 1961 Montana State University, MS 1970, EdD 1975 Utah State University.

BARD, ELAINE (1987) Temp. Ext. Instr., Uintah Basin Branch Campus, Continuing Education. BA 1967 Ft. Lewis College, MA 1984 New Mexico State University.

BARDWELL, LISA V. (1995) Adjunct Asst. Prof., Sociology, Social Work and Anthropology. BA 1978 University of Denver, MS 1985, PhD 1989 University of Michigan.

BARFUSS, STEVE (1987) Research Engineer, Utah Water Research Laboratory; Engineer, Technical Research Laboratory, Space Dynamics Laboratory, USU Research Foundation. BS 1986, MS 1988 Utah State University.

BARKWORTH, MARY E. (1978) Assoc. Prof. and Director of Intermountain Herbarium, Biology. BS 1961 University of British Columbia, MEd 1970 Western Washington State College, PhD 1975 Washington State University.

BARNARD, DALE LYNN (1987) Research Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1975 Weber State College, MS 1977 Idaho State University, PhD 1987 Brigham Young University.

BARNES, FRANK L. (1992) Adjunct Research Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1976, MS 1977 University of Missouri, PhD 1988 University of Wisconsin.

BARNETT, BILL BURL (1977) Research Assoc. Prof., Biology. BS 1968 Washington State University, PhD 1975 Utah State University.

BARNHILL, JAMES V. (1985) Ext. Assoc. Prof. and Weber County Agent (Agriculture), University Extension. BS 1978 Brigham Young University, MS 1984 Utah State University.

BAROWY, WILLIAM M. (1985) Research Associate, Stewart Radiance Laboratory, Space Dynamics Laboratory, USU Research Foundation. BS 1979, MS 1984, PhD 1986 University of Massachusetts.

BARRETT, CHRISTOPHER B. (1994) Asst. Prof., Economics. AB 1984 Princeton University, MS 1985 University of Oxford, PhD 1994 University of Wisconsin (Madison).

BARRINGER, DONALD G. (1989) Asst. Director, SKI*HI Institute, Communicative Disorders and Deaf Education. BA 1966 Chico State College, MS 1971 Utah State University.

BARTA, JAMES J. (1995) Asst. Prof., Elementary Education. BS 1977 Colorado State University, MA 1980 University of North Colorado (Greeley), PhD 1991 University of Oregon.

BARTHOLOME, LLOYD W. (1968) Dept. Head and Prof., Business Information Systems and Education. BS 1955 Northern State College, MA 1960 Los Angeles State College, EdD 1968 University of California (Los Angeles).

BARTKUS, KENNETH R. (1990) Asst. Prof., Business Administration. BA 1983 California State University, MBA 1985 Humboldt State University, PhD 1991 Texas Tech University.

BARTON, JOHN D. (1988) Adviser, Uintah Basin Branch Campus, Continuing Education. BA 1987, MA 1988 Brigham Young University.

BARTON, PATRICIA A. (1983) Teacher, Center for Persons with Disabilities. BS 1976 Utah State University.

BARTOS, DALE L. (1992) Adjunct Asst. Prof., Rangeland Resources. BS 1966, MS 1968 Fort Hays State University (Hays, Kansas), PhD 1972 Colorado State University.

BARTSCHI, BRENT Y. (1971) Senior Research Engineer, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1970 Weber State College, ME 1978 Utah State University.

BARTZ, BRENT A. (1990) Research Engineer, Civil and Environmental Engineering. BS 1987, MS 1990 Utah State University.

BATABYAL, AMITRAJEET A. (1995) Asst. Prof., Economics. BS 1987 Cornell University, MS 1990 University of Minnesota, PhD 1994 University of California (Berkeley).

BATES, IRENE L. (1972) Asst. Director, Programs and Entertainment, Student Services. BS 1958 Utah State University.

BATES, LYNN R. (1977) Research Technologist, Systems Division, Space Dynamics Laboratory, USU Research Foundation.

BATTY, JOSEPH CLAIR (1963) Prof., Mechanical and Aerospace Engineering. BS 1961, MS 1963 Utah State University, ScD 1969 Massachusetts Institute of Technology.

BAUCUS, DAVID A. (1994) Asst. Prof., Management and Human Resources. BS 1982, MBA 1986, PhD 1988 Indiana University.

BAUCUS, MELISSA S. (1994) Asst. Prof., Management and Human Resources. BS 1981, MBA 1986, PhD 1988 Indiana University.

BAUER, WOLFGANG DIETZGEN (1993) Visiting Prof., Biology. BS 1961 Utah State University, PhD 1971 University of Colorado.

BAUGH, MARK R. (1992) Research Associate, Industrial Technology and Education. BS 1989 University of Utah, MS 1992 Utah State University.

BAUM, DIANE CRAIG (1983) Director, Disability Resource Center, Student Services. BS 1980 Wright State University, MS 1992 Utah State University.

BAUMGARDNER, KANDY (1995) Asst. Dean for Undergraduate Affairs, College of Science; Prof., Biology. BS 1968 Bradley University, PhD 1973 Utah State University.

BAYN, KATHLEEN E. (1984) Academic Adviser, College of Engineering. BA 1971 Michigan State University.

BAYN, ROBERT L., Jr. (1986) Manager of Academic Services, Computer Services. BS 1972 Michigan State University, MS 1975, PhD 1982 Utah State University.

BEAN, LAURIE (1991) Faculty Assistant (Vocal), Music. BM 1991 Utah State University.

BEASLEY, LEROY B. (1981) Prof., Mathematics and Statistics. BS 1964, MS 1966 Idaho State University, PhD 1969 University of British Columbia.

BECK, STEVEN V. (1991) Assistant to the Dean, School of Graduate Studies. BA 1975, MA 1987 Utah State University.

BECK-DUDLEY, CARYN LEE (1984) Assoc. Prof., Management and Human Resources. BS 1980 Utah State University, JD 1983 University of Idaho College of Law.

BECKER, KURT (1994) Assoc. Prof., Industrial Technology and Education. BS 1977 Southeast Missouri State University, MS 1983 Sam Houston State University, PhD 1988 Texas A&M University.

BEECHER, BETTY J. R. (1972) Asst. Prof., Music. BM 1972, MM 1977 Utah State University.

BEGAY, R. CRUZ (1993) Research Associate, Center for Persons with Disabilities. BA 1974 California State University (Hayward), MPH 1977, DrPH 1985 University of California (Berkeley).

BEGNAL, KATE M. (1981) Assoc. Prof., English. BA 1963 College of St. Elizabeth, MA 1965, PhD 1974 Pennsylvania State University.

BEHL, DIANE D. (1981) Specialist—Evaluation, Center for Persons with Disabilities. BS 1977 University of Wisconsin, MS 1985 Utah State University.

BEHM, FRED C. (1975) Director, Extramurals and Recreation Facilities, ASUSU. BS 1974 Utah State University.

BELL, CHARLES EDGAR (1993) Director, Athletics. BS 1968, MS 1969 Eastern Illinois University.

BELL, DAVID LEON (1993) Asst. Prof. and Ext. Landscape Architect—Community Development, Landscape Architecture and Environmental Planning. BLA 1967 Utah State University, MLA 1969 University of Michigan.

BELL, GLORIA J. (1993) Temp. Lecturer, Elementary Education. BS 1967, MS 1971 Eastern Illinois University.

BELL, KURTIS (1993) Senior Programmer/Analyst, Computer Services.

BELL, WILLIAM EARL (1986) Adjunct Prof., Physics. BS 1941 University of Alberta.

BELLISTON, JAMES T. (1988) Systems Analyst and Computer Specialist, University Extension. BS 1982, MS 1985 Utah State University.

BELLISTON, WARD P. (1984) Assoc. Prof., Industrial Technology and Education. BS 1967 Utah State University, MA 1973 Arizona State University, PhD 1977 Colorado State University.

BELOVSKY, GARY E. (1991) Prof., Fisheries and Wildlife. BBA 1972 University of Notre Dame, MSS 1974 Yale University, PhD 1977 Harvard University.

BENHAM, NANCY E. (1995) Asst. Prof., Communicative Disorders and Deaf Education. BS 1986, MS 1988 Lamar University, PhD 1995 University of Southern Mississippi.

BENJELLOUN, SABAH (1995) Adjunct Asst. Prof., Rangeland Resources. BS 1979 Institut Agronomique et Veterinaire Hassan II, MS 1985 Iowa State University, PhD 1993 Tufts University (Medford, Massachusetts).

BENNETT, MARVIN C. (1984) Admin. Assistant, Ecology Center. BS 1976 Utah State University.

BENSON, JAN H. (1983) Asst. Director, High School/College Relations; Asst. Director, Programs and Entertainment, Student Services. BS 1983 Utah State University.

BENSON, PEGGY G. (1989) Clinical Asst. Prof., Communicative Disorders and Deaf Education. BS 1971 Arkansas State University, MA 1973 University of Iowa, EdS 1988 Utah State University.

BENTLEY, MARION T. (1972) Human Resources Extension Specialist, Economics. BA 1968 Brigham Young University, MPA 1972 New York University.

BERGE, CHARLES W. (1994) Technology Transfer Specialist, Nutrition and Food Sciences. BA 1958, MS 1960 Brigham Young University, PhD 1972 University of Wisconsin.

BERGER, JANIS MARLENE (1987) Administrative Assistant to Vice President, University Extension.

BERGESON, CHAD B. (1994) Specialist, Disability Resource Center, Student Services. BS 1994 Utah State University.

BERGMAN, BETTY JEAN (1983) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1947 Brigham Young University.

BERKEY, FRANK THOMAS (1978) Research Prof., Physics. BS 1962 Linfield College, MS 1964, PhD 1971 University of Alaska.

BERNHISEL, DONNA J. (1995) Teaching Specialist, Academic Support Services. BS 1985 Brigham Young University, MA 1995 Utah State University.

BERRETT, BEN R. (1994) Mechanical Engineer, Construction, Maintenance, and Repairs, Physical Plant. BS 1994 Utah State University.

BERRY, E. HELEN (1984) Assoc. Prof., Sociology, Social Work and Anthropology. BA 1975 Westminster College, MA 1979, PhD 1983 Ohio State University.

BETSCHART, DEBORAH M. (1994) Specialist, Center for Persons with Disabilities. BS 1990 Weber State University.

BIALKOWSKI, STEPHEN E. (1983) Prof., Chemistry and Biochemistry; Adjunct Prof., Physics and Electrical and Computer Engineering. BS 1975 Eastern Michigan University, PhD 1978 University of Utah.

BIESINGER, ESTHER L. (1990) Administrative Assistant, Fisheries and Wildlife. BA 1987 Utah State University.

BILBAO, STEVEN C. (1981) Environmental Health/Safety Manager, Environmental Health and Safety; Lecturer and Ext. Specialist—Safety, University Extension. BS 1977 Utah State University.

BINGHAM, GAIL ELDON (1982) Research Assoc. Prof., Plants, Soils, and Biometeorology; Adjunct Research Assoc. Prof., Geography and Earth Resources. BS 1968 Utah State University, MS 1968, PhD 1972 Cornell University.

BIRCH, NANCY R. (1992) Instr., Languages and Philosophy. BS 1982, MS 1988 Utah State University.

BIRDWELL, JOHN CODY (1994) Asst. Prof., Music. BM 1981, MA 1982 West Texas State University, DMA 1996 University of North Texas.

BISHOP, A. BRUCE (1971) Dean, College of Engineering; Director, Engineering Experiment Station; Prof., Civil and Environmental Engineering and Utah Water Research Laboratory. BS 1965, MS 1966 Utah State University, PhD 1970 Stanford University.

BISSONETTE, MARY E. (1994) Program Administrator, Family and Human Development. BA 1965 College of St. Catherine (St. Paul, Minnesota), MS 1992 Utah State University.

BISWAS, BASUDEB (1976) Prof., Economics. BA 1954, MA 1956 Calcutta University, MA 1975, PhD 1976 University of Chicago.

BITNER, WADE BARR (1978) Ext. Asst. Prof. and Salt Lake County Agent, University Extension. BS 1969 University of Utah, MS 1978 Utah State University.

BLACK, DUANE E. (1990) Programmer/Analyst, Computer Services. BS 1988 University of Idaho.

BLACK, MICHAEL D. (1995) Director, Housing Services, Auxiliary Enterprises. BS 1981 Utah State University.

BLAHNA, DALE J. (1991) Assoc. Prof., Forest Resources; Adjunct Assoc. Prof., Sociology, Social Work and Anthropology; Adjunct Assoc. Prof., Geography and Earth Resources; Adjunct Assoc. Prof., Landscape Architecture and Environmental Planning. BA 1975 University of Wisconsin (Milwaukee), MS 1978 University of Wisconsin (Stevens Point), PhD 1985 University of Michigan.

BLAIR, JAMES CARSON (1979) Prof. and Director of the Program in Education of the Deaf and Hard of Hearing, Communicative Disorders and Deaf Education. BS 1966 University of Utah, MS 1969 Utah State University, PhD 1976 Northwestern University.

BLAIR, MARTIN EDWARD (1993) Specialist, Center for Persons with Disabilities. BS 1991 Utah State University.

BLAIR, PATRICIA (1989) Specialist, Computer Services. BS 1980 Utah State University.

BLAKE, DAVID G. (1991) Adjunct Assoc. Prof., Civil and Environmental Engineering. BS 1967, MBA 1969 University of Utah.

BLAKE, JULANN (1987) Administrative Assistant, Center for Persons with Disabilities. BS 1983 Brigham Young University.

BLAKELEY, JEFFREY G. (1978) Research Engineer, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1972 Weber State College, ME 1980 Utah State University.

BLAKELEY, SHELLEY C. (1988) Instr., Languages and Philosophy. BA 1975 and 1976 Weber State College.

BLOTTER, PAUL THOMAS (1970) Prof., Mechanical and Aerospace Engineering and Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1964, MS 1966 Utah State University, PhD 1968 Michigan State University, PE.

BLUBAUGH, DANNY J. (1991) Asst. Prof., Chemistry and Biochemistry. BA 1980 Earlham College, PhD 1987 University of Illinois (Urbana-Champaign).

BODILY, STANLEY A. (1991) Asst. Registrar, Enrollment Services. BS 1987 Utah State University.

BODINE, PATRICIA (1991) Administrative Assistant, Center for Persons with Disabilities.

BOETTINGER, JANIS L. (1992) Asst. Prof., Plants, Soils, and Biometeorology; Adjunct Asst. Prof., Geology. BS 1984 Cornell University, MS 1988, PhD 1992 University of California (Davis).

BOHN, LOUIS EMIL (1977) Adjunct Assoc. Prof., Communication. BA 1974 University of California (Davis), MA 1976 University of Montana, PhD 1984 University of Utah.

BOLLING, DOYT Y. (1995) Director—Utah Technology Transfer Center, Civil and Environmental Engineering. BS 1962 Virginia Polytechnic Institute and State University, MS 1974 George Washington University.

BOLTON, JOHN W. (1995) Program Specialist, Conference and Institute Division, Continuing Education. BA 1994 Utah State University.

BOMAN, RONALD L. (1980) Research Assoc. Prof. and Dairy Management Specialist (Ecuador), Animal, Dairy and Veterinary Sciences. BS 1962 Utah State University, MS 1965 Virginia Polytechnic and State University, PhD 1967 Michigan State University.

BOMAN, WESLEY K. (1995) Director of Development, College of Family Life and College of Education. BS 1963 Brigham Young University.

BOND, LARRY KEITH (1972) Assoc. Prof., Economics; Agricultural Economics Specialist, University Extension. BA 1960 Brigham Young University, MS 1962 University of Arizona, PhD 1972 Utah State University.

BORG, THOMAS GARTH (1982) Administrator of Conference Publications and Grants, and Ext. Instr., Conference and Institute Division, Continuing Education. BS 1980, MEd 1981 Brigham Young University.

BOSTON, DANIEL AGEE (1978) Clinical Asst. Prof., Biology. BS 1972 Utah State University, DDS 1976 Northwestern University.

BOUDRERO, RICHARD ALAN (1983) Manager, Central Distribution Center.

BOUTWELL, DEBORAH LEA H. (1985) Library Media Specialist, Edith Bowen Laboratory School; Adjunct Instr., Instructional Technology. BS 1980 University of Southern Mississippi, MEd 1987 Utah State University.

BOUTWELL, KENNETH E. (1981) Director, Multimedia and Distance Learning Services; Adjunct Asst. Prof., Communication; International Programs Coordinator, Merrill Library and Learning Resources Program. BA 1974 University of Southern Mississippi, MEd 1985 Utah State University.

BOWDEN, KENT R. (1994) Computer Lab Supervisor, Uintah Basin Branch Campus, Continuing Education. BS 1994 Utah State University.

BOWEN, SANDRA (1991) Adjunct Clinical Instr., Communicative Disorders and Deaf Education. BS 1988, MEd 1989 Utah State University.

BOWLES, DAVID S. (1977, 1983) Director and Prof., Utah Water Research Laboratory; Director, Utah Center for Water Resources Research; Prof., Civil and Environmental Engineering. BS 1972 City University (London), PhD 1977 Utah State University.

BOWLES, TYLER J. (1994) Lecturer, Economics. BS 1984, MS 1986 Utah State University, PhD 1991 University of North Carolina.

BOWNS, JAMES E. (1965) Prof., Rangeland Resources. BS 1961, MS 1963, PhD 1974 Utah State University.

BOYCE, GLENNA COOPER (1989) Research Assistant, Center for Persons with Disabilities; Adjunct Asst. Prof., Family and Human Development. BA 1960 Brigham Young University, MS 1969, PhD 1990 Utah State University.

BOYER, FAYE P. (1979) Ext. Instr. and Summit County Agent, University Extension. BS 1961 Utah State University.

BOYES, KATE (1993) Asst. Editor, English. BS 1987 University of Utah, MS 1992 Utah State University.

BRACKNER, JAMES W. (1981) Director, Master of Accounting Program; Assoc. Dept. Head and Prof., School of Accountancy. BS 1961, MS 1962 Brigham Young University, CPA 1965 State of California, PhD 1983 University of Alabama.

BRADLEY, SCOTT NELSON (1990) Director, Telecommunications and Telephone Services. BS 1987 Westminster College, MPA 1991 Brigham Young University.

BRAEGER, TODD J. (1989) Specialist, Center for Persons with Disabilities. BS 1985 South Dakota State University, MS 1989 Utah State University.

BRAGG, VIRGINIA C. (1985) Adjunct Clinical Instr., Nutrition and Food Sciences. BS 1962 Brigham Young University, MS 1968 Utah State University.

BRAUN, DAVID (1990) Ext. Asst. Prof. and Washington County Agent, University Extension. BS 1986, MS 1988 Brigham Young University.

BREGENZER, DAVID D. (1986) Principal Lecturer, Mathematics and Statistics. BS 1975 Washington University, MS 1978 Southern Illinois University.

BRENNAND, CHARLOTTE P. (1968) Assoc. Prof. and Ext. Specialist, Nutrition and Food Sciences. BS 1965 New Mexico State University, MS 1967 University of California (Davis), PhD 1989 University of Wisconsin (Madison).

BREWER, KENNETH W. (1968) Prof. and Director of Graduate Studies, English. BA 1965 Western New Mexico University, MA 1967 New Mexico State University, PhD 1973 University of Utah.

BREWER, KEVIN K. (1995) Asst. Librarian, Library and Information Services, Learning Resources Program. BA 1978 State University of New York (New Paltz), BS 1992 State University of New York (Syracuse), MLS 1995 Indiana University.

BRIM, LARRY H. (1989) Adjunct Prof., Mechanical and Aerospace Engineering. BES 1961, MS 1962 Brigham Young University, PhD 1969 Stanford University.

BRINCK, EDWARD A. (1987) Architectural Project Manager, Campus Planning and Engineering.

BRINDLEY, WILLIAM A. (1965) Prof. and Director of Graduate Studies, Biology; Chairman, Chemical Hygiene Committee. BS 1960, MS 1963, PhD 1966 Iowa State University.

BRINGHURST, ANTONE H. (1966) Assoc. Dean and Ext. Program Leader, College of Science; Assoc. Prof., Mathematics and Statistics. BS 1963, MS 1965 Utah State University.

BRINGHURST, JANET (1995) Counselor, Financial Aid Office. BS 1987 Utah State University.

BRISTOW, DOUGLAS J. (1993) Asst. Prof., Aerospace Studies. BS 1984 Oregon State University, MS 1986 University of Oregon.

BROADBENT, JEFFERY R. (1992) Asst. Prof., Nutrition and Food Sciences. BS 1987, PhD 1992 Utah State University.

BROADBENT, STEVEN R. (1977) Business Manager, University Extension. BS 1972, MBA 1980 Utah State University.

BRODIE, EDMUND D., Jr. (1994) Dept. Head and Prof., Biology. BS 1963 Oregon College of Education, MS 1967, PhD 1969 Oregon State University.

BROOKS, TERESA (1990) Ext. Asst. Prof. and Weber County Agent, University Extension. BS 1983 Brigham Young University, MS 1987 Utah State University.

BROOME-HYER, HOLLY (1986) Graphic Artist, University Extension; Graphic Artist, University Relations and Development. BA 1976 Utah State University.

BROTHERSEN, CARL (1993) Assoc. Director—Western Center for Dairy Protein Research and Technology. BS 1976, MS 1977 Utah State University.

BROWER, OWEN J. (1979) Buyer, Purchasing. BS 1966 Utah State University.

BROWN, ANITA BUDGE (1985) Administrative Assistant, Psychology. BS 1966 Utah State University.

BROWN, CRAIG B. (1992) Adjunct Asst. Prof., Special Education and Rehabilitation. BS 1969, MS 1973, PhD 1979 University of Utah.

BROWN, LESLIE I. (1995) Computer Programmer, Ecology Center. BS 1987 University of New Mexico, MS 1991 Stanford University.

BROWN, M. TRACY (1991) Senior Accountant, Controllers Office. BS 1989 Utah State University.

BROWN, RAY W. (1983) Adjunct Prof., Plants, Soils, and Biometeorology. BS 1963, MS 1965 University of Montana, PhD 1974 Utah State University.

BROWN, ROBERT S. (1993) Asst. Prof., Chemistry and Biochemistry. BS 1978 University of Lowell, PhD 1983 Virginia Polytechnic Institute and State University.

BROWN, RODNEY J. (1979) Dean, College of Agriculture; Prof., Nutrition and Food Sciences. BS 1972 Brigham Young University, MS 1973 Utah State University, PhD 1977 North Carolina State University.

BROWN, WILLIAM RONALD (1990) Supervisor, Agricultural Systems Technology and Education. BS 1977 Utah State University.

BRUCE, MARSHALL H. (1979) Research Associate, Stewart Radiance Laboratory, Space Dynamics Laboratory, USU Research Foundation. AB 1957 Clark University.

BRUNSON, MARK WILLIAM (1992) Asst. Prof., Forest Resources; Adjunct Asst. Prof., Rangeland Resources; Adjunct Asst. Prof., Landscape Architecture and Environmental Planning. BA 1974 State University of New York (Binghamton), MS 1989, PhD 1991 Oregon State University.

BRYANT, LARRY D. (1995) Adjunct Assoc. Prof., Rangeland Resources. BS 1974 Oregon State University, MS 1979 University of Idaho, PhD 1993 Oregon State University.

BUCHANAN, BARBARA W. (1974) Senior Lecturer, Intensive English Language Institute. BA 1970, MA 1972 Utah State University.

BUCKLEY, DAVID W. (1995) Computer Specialist, Cache County Memory Study, College of Family Life. BA 1976, MA 1977 University of Denver.

BUCKNER, ROBERT E. (1994) Research Asst. Prof., Animal, Dairy and Veterinary Sciences; Poultry Specialist, University Extension. BS 1970, MS 1980 Brigham Young University, PhD 1984 Oregon State University.

BUDGE, SCOTT E. (1989) Asst. Prof., Electrical and Computer Engineering. BS 1984, MS 1985, PhD 1990 Brigham Young University.

BUDGE, VERN JENSEN (1967) Assoc. Prof., Landscape Architecture and Environmental Planning. BS 1965 Utah State University, MLA 1967 University of Illinois.

BUFFLER, SUSAN (1995) Research Associate, Plants, Soils, and Biometeorology. BFA 1987 University of Minnesota (Minneapolis), MS 1994 University of Connecticut (Storrs).

BUGBEE, BRUCE GERRY (1981) Assoc. Prof., Plants, Soils, and Biometeorology. BA 1973, BS 1975 University of Minnesota, MS 1977 University of California (Davis), PhD 1981 Pennsylvania State University.

BULLEN, REED, Jr. (1984) Physician, Student Health Services. BA 1963 Utah State University, MD 1974 University of Utah.

BUNCH, THOMAS DAVID (1973) Prof., Animal, Dairy and Veterinary Sciences, Fisheries and Wildlife. BS 1968, MS 1969 Brigham Young University, PhD 1971 Utah State University.

BUNDERSON, F. BRENT (1994) Ext. Asst. Prof. and Tooele County Agent, University Extension. BS 1989, MS 1993 Utah State University.

BUNNELL, DAVID R. (1977) Research Technologist, Systems Division, Space Dynamics Laboratory, USU Research Foundation.

BUNNELL, JoLENE B. (1993) Ext. Asst. Prof. and Utah County Agent, University Extension. BS 1988 Utah State University, MS 1992 Brigham Young University.

BURKE, LEE H. (1977) Asst. to President for Government Relations; Secretary to Board of Trustees. BS 1965, MS 1967 Utah State University, PhD 1971 University of Maryland.

BURNHAM, BYRON ROBERT (1973) Program Leader—Outreach Technology and Assoc. Dean, Learning Resources Program; Staff Development and Evaluation Specialist, University Extension; Assoc. Prof., Instructional Technology; Research Assoc. Prof., Psychology. BS 1969, MS 1971 Utah State University, EdD 1984 University of British Columbia.

BURNHAM, JULIA A. (1980) Specialist, Regional Resource Center, Center for Persons with Disabilities. BS 1972, MS 1983 Utah State University.

BURRELL, W. CRAIG (1978) Assoc. Prof., Animal, Dairy and Veterinary Sciences; Area Livestock Specialist, Utah County, University Extension. BS 1968 Brigham Young University, MS 1972 Colorado State University, PhD 1977 Texas A&M University.

BURRITT, ELIZABETH (1987) Research Associate, Rangeland Resources. BS 1979 California State University (San Luis Obispo), MS 1983 Utah State University.

BURT, DAVID A. (1970) Research Prof., Electrical and Computer Engineering; Assoc. Director and Chief Engineer, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1962, MS 1967 University of Utah.

BURT, LINDA (1995) Asst. Coach, Women's Track and Field, Intercollegiate Athletics.

BURTON, WARREN L. (1965) Prof., Music. BS 1962, MA 1965 Utah State University, DMA 1974 University of Oregon.

BUSH, DAVID W. (1989) Staff Psychologist, Counseling, Student Services; Adjunct Asst. Prof., Psychology. BS 1977, MA 1978 Brigham Young University, PhD 1984 Utah State University.

BUSHMAN, MARK A. (1969) Asst. Director for Off-Campus Production Services, Publication Design and Production. BS 1968 Utah State University.

BUTKUS, MICHAEL FRANK (1988) Program Administrator, Institute for Outdoor Recreation and Tourism; Senior Lecturer, Forest Resources. BS 1968, MS 1976 Utah State University.

BUTLER, ANNE M. (1989) Prof., History; Co-editor, *Western Historical Quarterly*. BS 1973 Towson State University, MA 1975, PhD 1979 University of Maryland. Sabb. 1995-96 academic year.

BUTLER, JOHN ALFRED (1989) Temp. Lecturer, English. BS 1957 Towson State College, MEd 1965, MLA 1977 Johns Hopkins University. LWOP 9-11-95 to 6-8-96.

BUTTARS, ANN (1983) Asst. Librarian and Asst. Curator, Library Services, Learning Resources Program. BS 1971, MS 1978 Utah State University.

BUTTARS, L. JON (1986) Contract Administrator, Business Service Center, USU Research Foundation. BS 1961 Weber State College.

BYBEE, KEVIN R. (1994) Asst. Director—Intramurals, Student Activities, Student Services. BS 1991 Utah State University.

BYINGTON, EVERTT J. (1981) Internal Auditor, Fiscal Operation. BS 1971 Brigham Young University.

BYRNE, PENNY M. (1984) Assoc. Prof., Communication. BA 1967 Texas Western College, MA 1969 University of Texas.

BYRNES, DEBORAH A. (1983) Prof., Elementary Education; Adjunct Prof., Family and Human Development. BA 1974, MA 1978, PhD 1981 Arizona State University.

CAHOON, CLIFFORD R. (1969) Asst. Director, Information News Services. BS 1964, MS 1975 Utah State University.

CALDERWOOD, DIANNE J. (1983) Admin. Assistant, Business Service Center, USU Research Foundation. BS 1974 Youngstown State University.

CALDWELL MARTYN M. (1967) Prof., Rangeland Resources. BS 1963 Colorado State University, PhD 1967 Duke University.

CALHOUN, CARLA D. (1988) Specialist—Documentation Coordinator, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BA 1980 San Jose State University.

CALIENDO, JOSEPH A. (1992) Assoc. Prof., Civil and Environmental Engineering. BS 1969 University of Detroit, BS 1974 Humboldt State University, MS 1977, PhD 1986 Utah State University, PE.

CALL, CHRISTOPHER A. (1987) Assoc. Prof., Rangeland Resources. BS 1973 University of Nevada (Reno), MS 1977 Oregon State University, PhD 1982 Utah State University.

CALL, JERRALD (1995) Temp. Lecturer, Intensive English Language Institute. BS 1989 Rio Grande College (Rio Grande, Ohio), MA 1995 Ohio University.

CALL, NOELLE A. (1988) Director, Learning and Life Skills Center, Academic Support Services. BS 1970, MEd 1975 University of Nevada (Reno).

CALL, RONALD E. (1985) Asst. to Vice President for University Relations and Development; CEO, American West Heritage Foundation; Director, Festival of the American West; Director, Jensen Living Historical Farm. BS 1974 Utah State University.

CALLOWAY, MARCIA DIANE (1990) Asst. Prof., Sociology, Social Work, and Anthropology. BS 1975 Weber State College, MSW 1983, PhD 1990 University of Utah.

CALVERT, ANTHONY (1995) Registered Nurse, Cache County Memory Study, College of Family Life. BS 1984 Utah State University.

CAMPAN, RAYMOND (1992) Adjunct Prof., Biology. BS 1958 Lycics Lakanal et Henri IV, MS 1964, PhD 1970 University of Toulouse (France).

CAMPANELLA, ELAINE (1985) Coordinator of Visual Design, Multimedia and Distance Learning Services. BS 1965 Utah State University.

CAMPBELL, EILEEN P. (1994) Accountant, Accounting and Financial Reporting, Controllers Office. BS 1980 Utah State University.

CAMPBELL, PETER D. (1990) Supervisory Accountant, Controllers Office. BS 1979, BS 1981 Utah State University.

CAMPBELL, STEVEN K. (1988) Specialist—Mainstreaming, Center for Persons with Disabilities. BA 1985 University of Nebraska.

CAMPBELL, WILLIAM FRANK (1968) Prof., Plants, Soils, and Biometeorology. BS 1956, MS 1957 University of Illinois, PhD 1964 Michigan State University.

CAMPERELL, KAY BETH (1986) Assoc. Prof., Secondary Education. BA 1970 University of New Mexico, MA 1974 University of Missouri, PhD 1980 University of Wisconsin.

CANGELOSI, JAMES S. (1983) Prof., Secondary Education, Mathematics and Statistics. BS 1965, MEd 1967, MA 1971, PhD 1972 Louisiana State University.

CANNING, BECKY (1992) Teacher, Edith Bowen Laboratory School. BS 1968 Boston University, MEd 1973 University of Utah.

CANNING, CURTIS RAY (1977) Adjunct Prof., Psychology. AB 1968 Harvard University, MS 1969, MD 1973 University of Utah.

CANNON, HELEN (1993) Temp. Lecturer, English. BA 1960 Utah State University/University of Wisconsin, MA 1987 Utah State University.

CANNON, KENNETH H. (1985) Manager of Employee Benefits, Personnel Services. BS 1979, MS 1984 Utah State University.

CANNON, LAWRENCE O. (1961) Prof., Mathematics and Statistics. BS 1958 Utah State University, MS 1959 University of Wisconsin, PhD 1965 University of Utah.

CANNON, MARTHA EVELYN (1982) Lecturer, Human Environments. BFA 1975, MS 1982 Utah State University.

CANNON, SCOTT ROY (1983) Prof., Computer Science; International Programs Coordinator, College of Science. BS 1973, PhD 1977 University of Utah.

CARKIN, SUSAN (1974) Principal Lecturer, Intensive English Language Institute. BA 1968, BA 1969 Southern Illinois University, MA 1971 University of Oregon, MA 1985 Utah State University.

CARLSON, B. JILL (1985) Adjunct Lecturer, Nutrition and Food Sciences. BS 1967 Brigham Young University.

CARLSON, CHARLES RANDOLPH (1995) Research Associate, Fisheries and Wildlife. BA 1985 Virginia Wesleyan College.

CARLSON, NELS EARL (1976) Ext. Asst. Prof., Uintah Basin Branch Campus, Continuing Education. BS 1972 Weber State College, MFA 1979 Utah State University.

CARLSTON, BETTY J. (1987) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1962 Brigham Young University.

CARLSTON, GARY L. (1993) Assoc. Dean for Continuing Education and Field Services, Coordinator of International Programs, and Ext. Program Leader, College of Education; Assoc. Prof., Elementary Education. BS 1972, MEd 1976 Utah State University, EdD 1982 Brigham Young University.

CARMACK, NOEL A. (1994) Affiliate Librarian, Library and Information Services, Learning Resources Program. BFA 1993 Utah State University.

CARMAN, JOHN G. (1982) Assoc. Prof., Plants, Soils, and Biometeorology. BS 1976, MS 1979 Brigham Young University, PhD 1982 Texas A&M University.

CARPENTER, CHARLES EDWARD (1984) Assoc. Prof., Nutrition and Food Sciences. BS 1979, MS 1981, PhD 1984 University of Wisconsin (Madison).

CARROLL, BRYAN LOUIS (1993) Specialist, Center for Persons with Disabilities. BS 1988 University of Utah.

CARTEE, RAYMOND L. (1972) Research Asst. Prof., Plants, Soils, and Biometeorology; Director, Research Farms, Utah Agricultural Experiment Station. BS 1971, MS 1972 Utah State University.

CARTER, KAREN (1990) Faculty Assistant (Music Therapy), Music. BS 1987 Utah State University.

CASHELL, MARGARET M. (1988) Specialist—Documentation Coordinator, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1976 Ohio State University, MS 1980 University of Wisconsin.

CASTILLO, JANIS T. (1989) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1989 Brigham Young University.

CASTLETON, MARSHA A. (1987) Instr., WSU/USU Cooperative Nursing Program; Adjunct Lecturer, Biology. BS 1969 Brigham Young University.

CATLIN, JANE S. (1994) Temp. Asst. Prof.—Art Education, Art. BFA 1986 Utah State University, MAED 1987, MFA 1989 Rhode Island School of Design.

CAZIER, STANFORD (1960, 1979) Prof., History. BS 1952, MA 1956 University of Utah, PhD 1964 University of Wisconsin.

CELESTIN, J. VICTORIA (1991) Adviser, Science and HASS Advising Center. BA 1988 The Johns Hopkins University.

CHABRIES, DOUGLAS M. (1990) Adjunct Prof., Electrical and Computer Engineering. BS 1966 University of Utah, MS 1967 California Institute of Technology, PhD 1970 Brown University.

CHAMBERS, GARY A. (1979) Facilities Director, Continuing Education and Taggart Student Center; Director of Student Development. BS 1970, MBA 1982 Utah State University.

CHAMBERS, JEANNE C. (1988) Research Asst. Prof., Biology. BS 1975 Idaho State University, MS 1979, PhD 1987 Utah State University.

CHANDLER, CHARLES (1995) Asst. Football Coach, Intercollegiate Athletics. BA 1988 Central Washington University.

CHANDLER, GAYLEN N. (1993) Asst. Prof., Management and Human Resources. BS 1980 Brigham Young University, MBA 1989, PhD 1990 University of Utah.

CHAPMAN, CARL KIM (1991) Ext. Asst. Prof. and Rich County Agent, University Extension. BS 1986, MS 1988 Utah State University.

CHAPMAN, GALE WILLNER (1983) Adjunct Senior Research Scientist, Ecology Center. BA 1973, MS 1981 Frostburg State College.

CHAPMAN, JOSEPH A. (1983) Dean, College of Natural Resources; Prof., Fisheries and Wildlife. BS 1965, MS 1967, PhD 1970 Oregon State University.

CHATTERTON, JULIE P. (1995) Temp. Instr., Human Environments. BS 1980, MS 1985 Utah State University.

CHECKETTS, KEITH T. (1965) Prof., Psychology; Asst. Director, Institutional Research. BS 1959 Utah State University, PhD 1965 University of Minnesota.

CHEN, DONG (1995) Research Associate, Electrical and Computer Engineering. BS 1982, MS 1985 Xiamen University (China), PhD 1988 Nanjing University (China).

CHENEY, CARL D. (1968) Prof., Psychology. BS 1956 Utah State University, MA 1962, PhD 1966 Arizona State University.

CHENEY, DEBRA (1992) Adjunct Assoc. Prof., Special Education and Rehabilitation. BA 1974, MS 1983, PhD 1986 Utah State University.

CHENG, HENG-DA (1991) Assoc. Prof., Computer Science; Adjunct Assoc. Prof., Electrical and Computer Engineering. BS 1967 Harbin Polytechnical Institute (China), MS 1981 Wayne State University, PhD 1985 Purdue University.

CHENG, KUO-JOAN (1995) Adjunct Research Prof., Animal, Dairy and Veterinary Sciences. BSA 1963 National Taiwan University, MSc 1966, PhD 1969 University of Saskatchewan (Canada).

CHIDESTER, JOHN L. (1994) Research Associate, Biology.

CHILD, DEE R. (1982) Clinical Instr., Communicative Disorders and Deaf Education. BS 1974, MS 1979 Utah State University.

CHINN, MITCHELL S. (1991) Asst. Prof., Chemistry and Biochemistry. BS 1984 Hope College, M. Phil. 1986, PhD 1989 Yale University.

CHISHOLM, LINDA A. (1988) Specialist, Center for Persons with Disabilities. BA 1963 University of Missouri, MEd 1974 University of Rochester.

CHISHOLM, SCOTT A. (1986) Assoc. Prof., Communication. BA 1958 Graceland College, BA 1960, MA 1963 University of Missouri. Sabb. 1995-96 academic year.

CHITTALADAKORN, ACHARA (1993) Adjunct Asst. Prof., Plants, Soils, and Biometeorology. BS 1978 Chiengmai University, MS 1982, PhD 1989 Kasetsart University.

CHIU-OLIVARES, M. ISELA (1982) Assoc. Prof., Languages and Philosophy. BA 1973, MA 1976 University of Texas, PhD 1984 University of Kansas.

CHRISTENSEN, CONNIE (1995) Development and Public Relations Specialist and English Instr., Uintah Basin Branch Campus, Continuing Education. BS 1971, MS 1993 Utah State University.

CHRISTENSEN, JERRY L. (1992) Adjunct Clinical Instr., Special Education and Rehabilitation. BS 1972, MS 1976 University of Utah.

CHRISTENSEN, NEDRA K. (1985) Clinical Asst. Prof., Nutrition and Food Sciences; Food/Nutrition Specialist, University Extension. BA 1975 University of Utah, RD 1976 New England Deaconess Hospital, MS 1980 Utah State University.

CHRISTENSEN, ROGER B. (1993) Ext. Asst. Prof., Uintah Basin Branch Campus, Continuing Education. BS 1972 University of Utah, MS 1984 Utah State University.

CHRISTENSEN, SANDRA J. (1991) Ext. Asst. Prof. and Sanpete County Agent, University Extension. BS 1960, MS 1963 Utah State University.

CHRISTENSEN, VAL R. (1965) Vice President, Student Services; Adjunct Assoc. Prof., Management and Human Resources. BS 1959, MS 1963 Utah State University, PhD 1970 Michigan State University.

CHRISTIANSEN, MICHAEL K. (1977) Prof., Music. BM 1972, MM 1975 Utah State University.

CHRISTIANSEN, VANCE T. (1960) Prof., Civil and Environmental Engineering. BS 1959, MS 1960 University of Wyoming, PhD 1972 Purdue University, PE.

CINCOTTA, RICHARD PAUL (1985) Adjunct Asst. Prof., Rangeland Resources; Range Specialist, University Extension. BS 1975 SUNY College of Environmental Science and Forestry, MS 1982, PhD 1985 Colorado State University.

CLARK, DAVID H. (1985) Adjunct Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1977, MA 1979 University of Wyoming, PhD 1985 Utah State University.

CLARK, GENE DAVID (1983) Buyer, Purchasing, Physical Plant. BS 1976 Utah State University.

CLARK, J. RODNEY (1970) Director, General Registration. BS 1965, MS 1978 Utah State University.

CLARK, LINDA KAY (1990) Registered Nurse, Student Health Services.

CLEMENTS, LESTER THOMAS (1972) Supervisor of Restricted Fund Accounting, Controllers Office. BA 1965 Brigham Young University.

CLIFTON, YEATON H. (1981) Adjunct Prof., Physics. BS 1954, PhD 1961 Columbia University.

CLONINGER, MARY ELLEN (1994) Assoc. Director for Internal Operations, Intercollegiate Athletics. BS 1969 Southwest Missouri State University, MA 1973 University of Northern Colorado.

CLYDE, STEPHEN W. (1993) Asst. Prof., Computer Science. BS 1985, PhD 1993 Brigham Young University.

COCHRAN, DEBORAH CHRISTINE (1983) Specialist—Headstart Training, Center for Persons with Disabilities. BS 1974 Ohio State University, MEd 1975 University of Illinois.

COCKETT, NOELLE E. (1990) Assoc. Prof., Animal, Dairy and Veterinary Sciences; Adjunct Assoc. Prof., Biology. BS 1980 Montana State University, MS 1983, PhD 1985 Oregon State University.

COLE, C. ROBERT (1970) Prof., History. BS 1961 Ottawa University, MA 1967 Kansas State University, PhD 1971 Claremont Graduate School.

COLE, GLENDA R. (1974) Principal Lecturer, Intensive English Language Institute. BS 1962 Kansas State Teachers College, MS 1989 Utah State University.

COLE, PHYLLIS (1976) Program Administrator, Center for Persons with Disabilities; Clinical Assoc. Prof., Psychology, Special Education and Rehabilitation. BA 1970, MA 1972 California State University (Northridge).

COLEMAN, RANDALL W. (1984) Director of Income Accounting, Controllers Office.

COLLARD, TONYA (1987) Asst. Manager—Carousel Square, Food Services, Auxiliary Enterprises.

COLLAS, PHILIPPE (1992) Adjunct Research Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1983 Lycee F. Renaudeau, MS 1989 Unite d'Enseignement et de Recherche, PhD 1991 University of Massachusetts.

COLLIER, CURTIS C. (1990) Asst. Coach, Men's and Women's Track and Field, Intercollegiate Athletics. BS 1979 Texas A&M University, MEd 1981 University of Texas (El Paso), MS 1989 Utah State University.

COLLING, JAYE C. (1995) Manager—Facilities Maintanance, Facilities Maintenance, Physical Plant.

CONDIE, FRANK A. (1968) Prof., School of Accountancy. BS 1953, MS 1954 Utah State University, CPA 1963 State of Hawaii, DBA 1969 Arizona State University, CPA 1976 State of Utah.

CONOVER, DENISE O. (1992) Cataloger, Library and Information Services, Learning Resources Program; Adjunct Asst. Prof., History. BA 1973 Georgia Southern College, MA 1975, PhD 1978 Washington State University, Masters of Library Science 1990 Southern Connecticut State University.

CONOVER, MICHAEL R. (1991) Assoc. Prof., Fisheries and Wildlife. BS 1973 Eckerd College, MS 1975, PhD 1978 Washington State University.

CONSTANCE, SUSAN (1995) Registered Nurse, Cache County Memory Study, College of Family Life. BS 1976 Southern Illinois University, BSN 1984, MS 1985 University of Iowa.

CONTE, CHRISTOPHER A. (1995) Asst. Prof., History. BA 1981 Allegheny College, MA 1986, MA 1987 Ohio University, PhD 1994 Michigan State University.

COOK, DEBRA M. (1991) Part-time Instr., Business Information Systems and Education. BS 1987, MS 1989 Utah State University.

COOK, KENNETH LEON (1977) Designer Supervisor, Systems Division, Space Dynamics Laboratory, USU Research Foundation. AA 1965 Hartnell Jr. College, BS 1980 Utah State University.

COOLEY, DONALD H. (1972) Dept. Head and Assoc. Prof., Computer Science. BS 1967, MS 1969 Oregon State University, PhD 1973 University of Utah.

COOLEY, NOEL H. (1987) Research Engineer, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1963 Utah State University, MS 1970 San Jose State University.

COON, STEPHEN L. (1988) Mechanical Systems Designer, Campus Planning and Engineering.

COOPER, BRENDA (1994) Asst. Prof., Communication and Languages and Philosophy. BA 1986 Wright State University (Dayton), MA 1988 University of Dayton, PhD 1991 School of Interpersonal Communication, Ohio University.

COOPER, ELIZABETH J. (1990) Program Administrator, Student Activities, Student Services. BS 1984, MS 1989 Utah State University.

COOPER, SALLIE J. (1992) Adviser, Student Activities, Student Services. BFA 1983 University of Utah.

COOPER, TROY DICK (1986) Ext. Assoc. Prof. and Duchesne County Agent (Agriculture), University Extension. BS 1979, MS 1986 Utah State University.

COPENHAVER, JOHN D. (1989) Director of Regional Resource Center, Center for Persons with Disabilities. BA 1972 University of Utah, ME 1978 University of Montana.

COPPOCK, DAVID LAYNE (1991) Asst. Prof., Rangeland Resources. BS 1977, MS 1980, PhD 1985 Colorado State University.

CORAY, CHRIS S. (1975) Prof., Mathematics and Statistics. BS 1965, PhD 1973 University of Utah.

CORBIN-LEWIS, KIM (1989) Clinical Asst. Prof., Communicative Disorders and Deaf Education. BA 1979, MS 1980 Loyola College.

CORN, RAYMOND (1977) Gymnastics Coach, Intercollegiate Athletics; Lecturer, Health, Physical Education and Recreation. BS 1971 University of Northern Colorado.

CORNFORTH, DAREN P. (1977) Assoc. Prof., Ext. Specialist (Food/Nutrition), Nutrition and Food Sciences. BA 1971, MS 1974 Colorado State University, PhD 1978 Michigan State University.

COSTER, DANIEL C. (1990) Asst. Prof., Mathematics and Statistics. BA 1980, MA 1981 Cambridge University, PhD 1986 University of California (Berkeley).

COSTON, MICHAEL G. (1995) Director, Bookstore, Auxiliary Enterprises. BA 1973, MA 1975 Appalachian State University.

COUILLARD, GWENAELLE (1990) M. F. T., Counseling Services, Student Services; Adjunct Clinical Lecturer, Family and Human Development. BS 1986, MS 1988, PhD 1990 Brigham Young University.

COULOMBE, ROGER A., Jr. (1984) Prof., Animal, Dairy and Veterinary Sciences. BS 1977, MS 1979 University of Idaho, PhD 1982 Oregon State University.

COWLEY, DAVID T. (1995) Space Management Coordinator, Campus Planning and Engineering. BA 1988 Utah State University.

COX, MICHAEL D. (1995) Asst. Football Coach, Intercollegiate Athletics. BS 1988 University of Idaho.

COX, STEVEN D. (1972) Dept. Head (Provo), Utah County Agent, and Asst. Prof., University Extension. BS 1970, MS 1972 Utah State University.

CRAGUN, JOHN R. (1966) Dept. Head and Prof., Management and Human Resources; Prof., Psychology. BS 1959, MS 1961 Utah State University, PhD 1966 Purdue University.

CRAIG, CLIFFORD BEAN (1967) Prof., Geography and Earth Resources. BS 1963 College of Southern Utah, MA 1967 Ohio State University, PhD 1975 Clark University.

CRAIN, DAVID JAMES (1990) Research Asst. Prof., Physics and Center for Atmospheric and Space Sciences. BS 1985 Sam Houston University, MS 1987, PhD 1990 University of Texas (Dallas).

CRANE, JOHN L., Jr. (1992) Adjunct Assoc. Prof., Forest Resources. BS 1971 University of Utah, MS 1974 Utah State Unversity, PhD 1981 Michigan State University.

CRAPO, RICHLEY H. (1970) Prof., Sociology, Social Work and Anthropology, Psychology. BA 1967 California State University (Fullerton), MA 1968, PhD 1970 University of Utah.

CRAW, CHARLES L. (1968) Senior Research Engineer, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BA 1957 Utah State University.

CRITCHFIELD, REED MAJ (1994) Asst. Prof. and Enrollment Officer, Military Science. BS 1982, MBA 1986 University of Utah.

CROCKER, JOHN P. (1992) Hall Director, Housing Services, Auxiliary Enterprises. BA 1992 Loyola Marymount University.

CROSBY, DIANA (1993) Hall Director, Housing Services, Auxiliary Enterprises. BA 1993 Utah State University.

CROSSLEY, PERRY H. (1985) Supervisor, Custodial Services, Physical Plant.

CROW, DONNA E. (1985) Assoc. Director, Career Services and Cooperative Education. BS 1983 Utah State University.

CROWL, TODD A. (1990) Assoc. Prof., Fisheries and Wildlife. BA 1982 Ohio State University, MS 1984, MA 1989, PhD 1989 University of Oklahoma.

CROWLEY, SUSAN L. (1991) Asst. Prof., Psychology. BS 1983 University of Wisconsin (Madison), MS 1987, PhD 1991 Texas A&M University.

CULPEPPER, N. BRANDT (1991) Assoc. Prof., Communicative Disorders and Deaf Education. BS 1982, MEd 1983 University of Georgia, PhD 1990 University of Washington.

CUNDY, DONALD THOMAS (1986) Assoc. Prof., Communication. BA 1969 University of Minnesota, MA 1972 University of Hawaii, PhD 1977 University of Oregon.

CURTIS, KENNETH REX (1988) Specialist, Utah Water Research Laboratory. BS 1953, MS 1963 University of Utah.

CUTLER, ADELE (1988) Assoc. Prof., Mathematics and Statistics. BS 1983 University of Auckland (New Zealand), MS 1984, PhD 1988 University of California (Berkeley). Sabb. 9-11-95 to 6-8-96.

CUTLER, DAVID RICHARD (1988) Asst. Dept. Head and Assoc. Prof., Mathematics and Statistics. BS 1983 University of Auckland (New Zealand), MS 1985, PhD 1988 University of California (Berkeley).

DAHL, DREW (1988) Assoc. Prof., Business Administration. BSJ 1976 University of Florida, MBA 1980 University of Georgia, PhD 1987 University of Tennessee.

DAINES, DAVID R. (1967) Assoc. Prof., Management and Human Resources. BS 1953 Utah State University, JD 1955 University of Utah.

DAINES, ROBYN EILEEN (1985) Assistant to the Director, Honors Program. BA 1970 Utah State University.

DAMEN, MARK L. (1988) Assoc. Prof., History, Languages and Philosophy. AB 1978 University of Florida, MA 1980, PhD 1985 University of Texas (Austin). Sabb. 1995-96 academic year.

DAN, ROBERT (1987) Adjunct Assoc. Prof., Music. BS 1979, MM 1982 Juilliard School of Music.

DANCE, BETTY ANN (1990) Asst. Librarian, Library and Information Services, Learning Resources Program. BS 1962 University of Utah, MS 1964 Utah State University, MLS 1984 Brigham Young University.

DANIEL, WARREN T. CPT (1996) Asst. Prof., Military Science. BS 1991 United States Military Academy.

DAUGS, DONALD ROGER (1977) Prof., Elementary Education; Director of International Office of Water Education, Utah Water Research Laboratory. BS 1960 Winona State College, MS 1967, PhD 1970 Oregon State University.

DAVENPORT, VARLO R. (1992) Ext. Instr., Uintah Basin Branch Campus, Continuing Education. BS 1985 Southern Utah State College, MFA 1988 Ohio State University (Columbus).

DAVIS, IRVIN LEE (1992) Adjunct Assoc. Prof., Physics. PhD 1983 Utah State University.

DAVIS, JAMES W. (1990) Director, Student Health Services, Student Services. BS 1974 University of Iowa, MD 1978 University of Iowa, Internship and Residency at University of Utah, BC FP/ER 1981/1991 (Board Certified Family Practice/Emergency Room).

DAVIS, KELBY B. (1975) Computer Specialist, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1981 Utah State University.

DAVIS, NORMAN R. (1987) Ext. Asst. Prof., Uintah Basin Branch Campus, Continuing Education. BA 1963, MA 1966 Arizona State University, PhD 1971 University of Oregon.

DAVIS, JOHN KERMIT (1994) Asst. Coach—Men's Basketball, Intercollegiate Athletics. BS 1982, MA 1984 Mississippi State University.

DAVIS, ROBERT L. (1985) Director of Industry and Professional Relations, College of Engineering. BA 1967, MBA 1968 Utah State University.

DAWSON, SUSAN E. (1988) Assoc. Prof., Sociology, Social Work and Anthropology. BS 1981 University of Delaware, MSS 1983, PhD 1988 Bryn Mawr College. Sabb. 1995-96 academic year.

DeBYLE, NORBERT V. (1964) Adjunct Prof., Forest Resources; USDA Forest Service Intermountain Research Station (retired). BS 1953, MS 1957 University of Wisconsin, PhD 1962 University of Michigan.

DECKER, DAVID B. (1995) Specialist, Center for Persons with Disabilities. BS 1993, MS 1995 Utah State University.

DEER, MARLENE (1989) Specialist, Center for Persons with Disabilities; Clinical Instr., Special Education and Rehabilitation. BA 1970 University of Wisconsin.

DEER, HOWARD M. (1982) Assoc. Prof., Animal, Dairy and Veterinary Sciences; Acting Director, Center for Environmental Toxicology; Pesticides and Toxicology Specialist, University Extension. BS 1971 University of Wisconsin, MPH 1975, PhD 1985 University of Minnesota.

DEMARS, HOWARD GRIFFIN (1986) Research Assoc. Prof., Center for Atmospheric and Space Sciences, Physics. BS 1976, MS 1979, PhD 1986 Utah State University.

DENNIS, STEVEN A. (1995) Specialist—Courseware, Center for Persons with Disabilities. BA 1987 Brigham Young University, MS 1991, PhD 1995 Utah State University.

DENNISON, JOHN ROBERT (1988) Assoc. Prof., Physics. BS 1979 Appalachian State University, MS 1983, PhD 1985 Virginia Polytechnic Institute and State University.

DERRY, JAMES O. (1984) Assoc. Prof. and Graduate Program Coordinator, Communication. BS 1961 University of North Dakota, MS 1969 University of Wisconsin (Milwaukee), PhD 1972 Purdue University.

DEVER, MARTHA TAYLOR (1993) Asst. Prof., Elementary Education. BA 1970 Western State College, MA 1989, EdD 1993 University of Northern Colorado.

DeVILBISS, JOHN WILLIAM (1990) University Extension Information Specialist/Marketing Director, Information News Services; Information and Publications Specialist, University Extension. BA 1983 Brigham Young University.

DEVOE, KATHERINE E. (1993) Hall Director, Housing Services, Auxiliary Enterprises. BA 1993 St. Michael's College.

DeWALD, DARYLL B. (1995) Asst. Prof., Biology. BS 1983 University of Wyoming, PhD 1993 Texas A&M University.

DEWEY, STEVEN A. (1985) Prof., Plants, Soils, and Biometeorology; Ext. Specialist—Weed, University Extension. BS 1976 Utah State University, MS 1978 Montana State University, PhD 1981 Oregon State University.

DINERSTEIN, KENDRA S. (1990) Lecturer, Computer Science. BS 1968 University of Utah, MS 1989 Utah State University.

DINERSTEIN, NELSON T. (1980) Assoc. Prof., Computer Science. BS 1964, MS 1965 University of Massachusetts, PhD 1968 University of Utah.

DIXON, CHARLES E. (1993) Ext. Program Associate, Fisheries and Wildlife. BS 1976, BS 1988, MS 1990 New Mexico State University.

DIXON, ROBERT E. (1992) Information Systems Specialist, Housing Services, Auxiliary Enterprises. BS 1977 Brigham Young University.

DO, SUE (1976) Medical Technologist, Student Health Services. BS 1968 Utah State University.

DOBROWOLSKI, JAMES P. (1984) Assoc. Prof., Rangeland Resources. BS 1977 University of California (Davis), MS 1979 Washington State University, PhD 1984 Texas A&M University.

DOBSON, DOROTHY LYNN WATTS (1982) Teacher, Edith Bowen Laboratory School; Adjunct Instr., Elementary Education. BS 1974 Utah State University, MS 1981 University of Utah.

DONAHUE, MARY PATRICIA (1992) Graphic Artist, Utah Agricultural Experiment Station. BFA 1987, MFA 1992 Utah State University.

DONICH, DESIREE M. (1993) Clinical Instr., Music. BM 1990 University of Oregon, MM 1992 Florida State University.

DONIGAN, MARIE (1994) Specialist, Academic Support Services. BS 1969 Utah State University.

DORWARD, JAMES T. (1991) Asst. Prof., Elementary Education. BS 1978 Ohio State University, MA 1985 University of Wyoming, PhD 1991 University of Oregon.

DOTY, MARY E. (1989) Director and Psychologist, Counseling, Student Services; Adjunct Asst. Prof., Psychology. BA 1974 Eastern College, MS 1981 Southwestern Oklahoma State University, PhD 1990 Utah State University.

DOUCETTE, WILLIAM J. (1985) Assoc. Prof., Civil and Environmental Engineering and Utah Water Research Laboratory. BS 1978 University of Wisconsin, MS 1980 University of Minnesota, PhD 1985 University of Wisconsin.

DOUPNIK, JOE R. (1975) Prof., Electrical and Computer Engineering and Center for Atmospheric and Space Sciences. BS 1961 Duke University, MS 1963, PhD 1967 Pennsylvania State University.

DOYLE, KEVIN (1992) Asst. Prof., Theatre Arts. BA 1983 Saint Louis University, MFA 1985 University of Missouri.

DRAKE, JAMES MERRITT (1975) Assoc. Prof., Music. ARCM 1963 Royal College of Music, London, BA 1964 Brigham Young University, MM 1966 Indiana University, DMA 1973 University of Southern California.

DRAKE, LESTON D. (1994) Research Associate, Instructional Technology. BA 1991 Brigham Young University, MS 1993 Utah State University.

DRICKEY, RONALD K. (1987) Senior Lecturer, Secondary Education. BA 1970 California State University (San Francisco), MA 1986 University of California (Santa Barbara).

DROST, DANIEL T. (1992) Asst. Prof., Plants, Soils, and Biometeorology. BS 1980, MS 1983 Michigan State University, PhD 1991 Cornell University.

DROWN, DAVID B. (1979) Assoc. Dept. Head and Assoc. Prof., Biology; Chairman, University Safety Committee. BS 1967 University of Wisconsin (Superior), MS 1969 Michigan Technological University, MPH 1970, PhD 1973 University of Minnesota.

DU TOIT, JOHAN T. (1988) Postdoctoral Fellow, Rangeland Resources. BSc 1983 University of Capetown (South Africa), PhD 1988 University of Witwatersrand (South Africa).

DUDLEY, LYNN MURDOCK (1984) Prof., Plants, Soils, and Biometeorology. BS 1977, MS 1980 Utah State University, PhD 1983 Washington State University.

DUERDEN, BRUCE L. (1992) Asst. Prof. and Technical Director/Lighting Designer, Theatre Arts. BA 1983, MFA 1989 Brigham Young University.

DUESER, RAYMOND D. (1990) Dept. Head and Prof., Fisheries and Wildlife. BA 1967, MA 1970 University of Texas (Austin), PhD 1975 University of Michigan.

DUFFY, CHRISTOPHER J. (1981) Adjunct Assoc. Prof., Utah Water Research Laboratory, Civil and Environmental Engineering. BS 1975, MS 1977, PhD 1981 New Mexico Institute of Mining and Technology.

DUKE, JOANNE (1984) Asst. Prof., WSU/USU Cooperative Nursing Program; Adjunct Lecturer, Biology. BS 1964 Brigham Young University, MSN 1985 University of Utah.

DUKES, REBECCA A. (1994) Director of Major Gifts, Development Office. BA 1975 The University of Akron (Akron, Ohio).

DUNKLEY, KEVIN (1992) Temp. Lecturer, Elementary Education. BS 1979, MS 1981 Utah State University.

DUPIN, PAMELA A. (1994) Ext. Instr., Class Division, Continuing Education. BS 1993, MS 1994 Utah State University.

DUPONT, ROBERT RYAN (1982) Prof., Civil and Environmental Engineering; Assoc. Director, Utah Water Research Laboratory; Assoc. Director, Center for Water Resources Research. BS 1977, MS 1979, PhD 1982 University of Kansas.

DUPREE, MARK (1993) Computer Specialist, Purchasing. BS 1977 Brigham Young University, MBA 1987 University of Phoenix.

DURHAM, SUSAN L. (1990) Systems Analyst, Fisheries and Wildlife. BS 1974 Oklahoma State University, MS 1989 Utah State University.

DURTSCHI, REED R. (1958) Prof., Economics. BS 1952 Utah State University, PhD 1957 University of Washington.

DYBWAD, J. PETER (1982) Sr. Research Engineer, Stewart Radiance Laboratory, Space Dynamics Laboratory, USU Research Foundation. PhD 1966 University of Tubingen, Germany.

DYER, JAMES S. (1992) Adjunct Asst. Prof., Chemistry and Biochemistry. BS 1977 New Mexico Institute of Mining and Technology, PhD 1988 Utah State University.

DYRESON, MARGARET M. (1988) Adjunct Assoc. Prof., Psychology. BS 1955 Texas A&I University, MS 1973 University of New Mexico, PhD 1981 Florida State University.

DYSON, THOMAS A. (1980) Director of Annual Support, Development Office. BA 1953 University of North Texas, MS 1975 Utah State University.

EARL, BRYAN KENT (1995) Director of Development, KUSU-FM (Utah Public Radio). BS 1989 Utah State University.

EASTMAN, CHARLES W. (1981) Research Technologist, Stewart Radiance Laboratory, Space Dynamics Laboratory, USU Research Foundation. BS 1965 Massachusetts State College (North Adams).

EASTMOND, JEFFERSON NICHOLLS, Jr. (1976) Prof., Instructional Technology and Learning Resources Program; Adjunct Prof., Languages and Philosophy. BA 1968 University of Utah, MEd 1969 Ohio University, PhD 1976 University of Utah. Sabb. 1-1-96 to 12-31-96.

EDDLEMAN, DONNA M. (1995) Scholarship Counselor, Financial Aid Office. BS 1987 State University of New York (Albany).

EDE, DOUGLAS (1990) Studio Engineer, Radio Broadcasting, Multimedia and Distance Learning Services.

EDSTROM, ERIC D. (1989) Asst. Prof., Chemistry and Biochemistry. BS 1982 Ft. Lewis College, PhD 1987 University of Minnesota.

EDWARDS, ANGELA N. (1995) Specialist, Center for Persons with Disabilities. BS 1985 Utah State University.

EDWARDS, DEANNA MAE (1992) Adjunct Lecturer, Music.

EDWARDS, G. ALLAN (1980) Iron County Agent and Ext. Assoc. Prof., University Extension. BSA 1968 Southern Utah State College, PhD 1973 University of Arizona.

EDWARDS, GLEN L. (1969) Prof., Art. BFA 1968, MFA 1976 Utah State University.

EDWARDS, JILL FIRTH (1989) Program Specialist, Conference and Institute Division, Continuing Education.

EDWARDS, W. FARRELL (1959) Prof. and Assoc. Director of Honors, Physics. BS 1955 University of Utah, MS 1957, PhD 1960 California Institute of Technology.

EGBERT, GARY DEAN (1989) Supervisor—Microcomputer Services, Computer Services. BS 1988 Utah State University.

EGBERT, LARRE N. (1969) Assoc. Prof., Computer Science. BS 1959 Utah State University, PhD 1965 California Institute of Technology.

ELASSIOUTI, IBRAHIM M. (1992) Adjunct Prof., Civil and Environmental Engineering. BS 1952 Cairo University, MS 1954 Zurich Hochschule, MS 1956 University of Iowa, PhD 1958 Massachusetts Institute of Technology.

ELDREDGE, ANN S. (1995) Clinical Instr., Communicative Disorders and Deaf Education. BS 1960 University of Utah, MA 1990 University of Northern Colorado.

ELDREDGE, GARTH M. (1990) Prof., Special Education and Rehabilitation. BS 1959, MS 1963, PhD 1965 University of Utah.

ELIASON, JOY SORENSON (1990) Supervisor—Textbook Department, Receiving, and Express-a-book Outreach Programs, Bookstore, Auxiliary Enterprises.

ELIASON, LYNN RUSSELL (1968) Asst. Dept. Head and Prof., Languages and Philosophy. BS 1961 Utah State University, PhD 1970 University of Colorado.

ELIASON, MARY P. (1987) Administrative Assistant, Research Office.

ELLIOTT, ALEXANDER RAY (1989) Assoc. Director, High School/College Relations. BA 1977 Utah State University.

ELLIOTT, BRANDON K. (1995) Computer Specialist, College of Education.

ELLIS, LeGRANDE C. (1964) Prof., Biology; Chairman, Radiological Safety Committee. BS 1954, MS 1956 Utah State University, PhD 1961 Oklahoma State University.

ELLIS, PETER M. (1976) Prof., Business Administration. BS 1965 Portland State College, MBA 1970, PhD 1972 University of Wisconsin.

ELLSWORTH, JOHN C. (1985) Assoc. Prof., Landscape Architecture and Environmental Planning. BA 1976 University of Arkansas, MLA 1982 Utah State University.

ELSNER, YOKO (1974) Research Supervisor, Animal, Dairy and Veterinary Sciences. BS 1961 Utah State University.

ELSWEILER, ANNE (1993) Clinical Instr., Communicative Disorders and Deaf Education. BS 1976, MA 1981 Texas Woman's University.

ELSWEILER, JOHN (1986) Asst. Librarian, Library Services, Learning Resources Program. BA 1974 Washburn University, MLS 1977 North Texas State University.

ELWELL, CATHERINE A. (1991) Research Associate, Instructional Technology. BS 1986 Utah State University.

ELWELL, JOHN D. (1987) Research Engineer, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BSEE 1982 University of Utah.

ELWOOD, JAMES N. (1989) Microcomputer Laboratory Supervisor, Business Information Systems and Education.

EMERT, GEORGE H. (1992) President of Utah State University; Prof., Chemistry and Biochemistry. BA 1962 University of Colorado, MA 1970 Colorado State University, PhD 1973 Virginia Polytechnic Institute and State University.

EMILE, MARK ANDERS (1981) Assoc. Prof., Music. BA 1973 Pomona College, MM 1979 University of Nebraska, DMA 1987 University of Colorado.

EMMETT, JOHN W. (1967) Clinical Instr., Communicative Disorders and Deaf Education. BS 1950 Utah State University, MD 1958 University of Utah.

ENDTER-WADA, JOANNA L. (1991) Asst. Prof., Forest Resources; Adjunct Asst. Prof., Sociology, Social Work and Anthropology; Adjunct Asst. Prof., Geography and Earth Resources. BA 1977, MA 1979, PhD 1987 University of California (Irvine).

ENGLAND, CLARK MORGAN (1971) Director, Personnel Services, BS 1969, MBA 1977 Utah State University.

ENOS, STACEY (1996) Head Coach—Women's Soccer, Intercollegiate Athletics. BA 1987 University of North Carolina (Chapel Hill), BS 1993 University of Utah.

ENSIGN, SCOTT A. (1993) Asst. Prof., Chemistry and Biochemistry. BS 1986 Brigham Young University, PhD 1991 University of Wisconsin (Madison).

ENZ, MARILYN (1988) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1955 University of Utah.

ERICKSEN, SUSAN L. (1995) Practicum Coordinator, Family and Human Development. BS 1991 Utah State University.

ESPLIN, MARK P. (1980) Research Associate, Stewart Radiance Laboratory, Space Dynamics Laboratory, USU Research Foundation. BS 1976 Utah State University, PhD 1985 University of Massachusetts.

ESPY, CHRISTINE (1984) Instr., WSU/USU Cooperative Nursing Program; Adjunct Lecturer, Biology. BS 1974 University of Pittsburgh.

ESPY, PATRICK J. (1986) Research Prof., Physics and Science Division, Space Dynamics Laboratory, USU Research Foundation. BS 1974, MS 1979 University of Pittsburgh, PhD 1986 Utah State University.

ETCHBERGER, RICHARD C. (1995) Ext. Asst. Prof., Uintah Basin Branch Campus, Continuing Education; Asst. Prof., Fisheries and Wildlife. BS 1986 Unity College, MS 1988, PhD 1992 University of Arizona.

EUSTACHY, LARRY R. (1993) Head Basketball Coach, Intercollegiate Athletics. BS 1979 Long Beach State University.

EVANS, EDWARD "TED" W. (1988) Assoc. Prof. and Ext. Specialist (Entomology), Biology. BA 1973 Carleton College, MS 1976, PhD 1980 Cornell University.

EVANS, JAMES P. (1986) Assoc. Prof., Geology. BS 1981 University of Michigan, MS 1983, PhD 1987 Texas A&M University.

EVANS, JOHN O. (1967) Prof., Plants, Soils, and Biometeorology. BS 1957 University of Wyoming, MS 1963 Utah State University, PhD 1970 University of Minnesota.

EVANS, KAY L. (1987) Ext. Instr. and Weber County Agent (Nutrition), University Extension. BS 1979 Weber State College.

EVANS, RONALD COLE (1988) Research Associate, Animal, Dairy and Veterinary Sciences. BS 1969, MS 1988 Utah State University.

EVANS, TIFFANY (1995) Assoc. Director, Student Activities, Student Services. BS 1992 Utah State University.

FAIRBANKS, W. SUE (1994) Adjunct Asst. Prof., Biology. BS 1982 Wesleyn University (Nebraska), MS 1985 Colorado State University, PhD 1992 University of Kansas.

FAIRCHILD, JAN (1987) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1977 Utah State University.

FALCONER, ALLAN (1991) Dept. Head and Prof., Geography and Earth Resources. BS 1965, PhD 1967 University of Durham (England).

FALK, LAURA (1987) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1959 Idaho State University.

FALKENBORG, DONNA JEAN H. (1965) University Extension Publications Editor, University Extension. BS 1963 Utah State University.

FALLIS, TODD L. (1991) Asst. Prof., Music. BM 1983 Potsdam State University College of Arts and Sciences, MM 1985, PhD 1990 University of Southern California.

FAN, XITAO (1993) Asst. Prof., Psychology. BA 1982 Kunming Institute of Technology, MA 1989 Brigham Young University, PhD 1993 Texas A&M University.

FARMER, BONNIE RAE ANDERSON (1985) Adjunct Instr., Nutrition and Food Sciences. BS 1976, MS 1977 Utah State University.

FARRELL-POE, KATHRYN L. "KITT" (1991) Asst. Prof., Agricultural Systems Technology and Education, Biological and Irrigation Engineering; Water Quality Specialist, University Extension. BS 1979 University of Nebraska (Lincoln), MS 1984, PhD 1990 Purdue University.

FARRELLY, DAVID (1991) Assoc. Prof., Chemistry and Biochemistry. BS 1977, PhD 1980 University of Manchester (England).

FAUSETT, JONI (1987) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1987 Brigham Young University.

FAWCETT, WILLIAM B. (1991) Research Asst. Prof., Sociology, Social Work and Anthropology. BA 1975 University of New Mexico, MA 1980 University of Wyoming, PhD 1987 University of Massachusetts (Amhurst).

FAWSON, CHRISTOPHER (1990) Assoc. Prof., Economics. BA 1982 Weber State College, MS 1983, PhD 1986 Texas A&M University.

FEDER, KAREN (1995) Collection Development Specialist, Library and Information Services, Learning Resources Program. BS 1993, MLS 1994 University of Wisconsin (Milwaukee).

FEHLMAN, GENE A. (1987) Fire Marshall, Fire and Safety, University Police.

FEJER, BELA GYULA (1987) Prof., Physics and Center for Atmospheric and Space Sciences; Adjunct Prof., Electrical and Computer Engineering. BS 1968

University of Sao Paulo, Brazil, MS 1970 Comissao Nacional de Atividades Espaciais, PhD 1974 Cornell University.

FERGUSON, TAMARA JOCELYN (1988) Assoc. Prof., Psychology. BA 1974 California State University (Fullerton), MS 1977, PhD 1980 University of Alberta (Edmonton).

FERNEY, DON GEORGE (1985) Adjunct Assoc. Prof., Mechanical and Aerospace Engineering. BS 1965, MS 1966 Utah State University.

FERRARA, JOSEPH MICHAEL (1983) Research Associate, Center for Persons with Disabilities; Research Assoc. Prof., Special Education and Rehabilitation. BS 1970 University of Wisconsin, MS 1974 University of Wisconsin (Oshkosh), PhD 1978 Utah State University.

FERRO, ARI (1995) Adjunct Asst. Prof., Plants, Soils, and Biometeorology. BS 1966, MS 1967, PhD 1973 University of Utah.

FIECHTL, BARBARA J. (1987) Clinical Instr., Center for Persons with Disabilities. Special Education and Rehabilitation. BS 1975 Illinois State University, MS 1979 George Peabody College for Teachers of Vanderbilt University.

FIESINGER, DONALD WILLIAM (1976) Dept. Head and Assoc. Prof., Geology; Adjunct Assoc. Prof., Geography and Earth Resources; Assoc. Director, Liberal Arts and Sciences Program. BA 1966 State University College (Potsdam, New York), MS 1969 Wayne State University, PhD 1975 University of Calgary.

FIFE, ROBERT L. (1994) Research Associate, Nutrition and Food Sciences. BS 1979 Utah State University.

FIFIELD, MARVIN G. (1969) Prof., Special Education and Rehabilitation, Psychology; Director, Center for Persons with Disabilities. BA 1956, MEd 1958 Idaho State University, EdD 1963 Washington State University.

FINDLAY, PENNY (1984) Media/Videodisc Specialist and Lecturer, Center for Persons with Disabilities; Adjunct Instr., Instructional Technology. BS 1974, MS 1984 Utah State University.

FINDLAY, THOMAS D. (1981) Manager of Information Services, Physical Plant. BS 1975 Utah State University.

FISHBURN, MARK EUGENE (1983) Asst. Manager, Carousel Square, Food Services. Auxiliary Enterprises.

FISHER, LAURA B. (1987) Adjunct Prof., Psychology. BA 1968 Reed College, BS 1979 North Texas State University, MD 1983 Texas Tech University.

FISHER, NANCY A. (1987) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1977 Arizona State University.

FISHER, RICHARD FORREST (1982) Adjunct Prof., Forest Resources. BS 1964 University of Illinois, MS 1967, PhD 1968 Cornell University.

FISK, EDWARD P. (1981) Research Engineer/Geologist, Utah Water Research Laboratory. BS 1949 California Institute of Technology, MS 1967 University of Southern California.

FISTER, SUSAN L. (1991) Adjunct Clinical Instr., Special Education and Rehabilitation. BS 1970, MEd 1971 University of Utah.

FLANN, NICHOLAS (1991) Asst. Prof., Computer Science. BS 1982 Coventry Polytechnic (England), MS 1986, PhD 1991 Oregon State University.

FLEMING, JOHN (1990) Affiliate Librarian, Library and Information Services, Learning Resources Program. BA 1979 Fort Lewis College, MLS 1987 University of Arizona.

FLINT, STEPHAN D. (1982) Research Associate, Rangeland Resources. BS 1974 University of Santa Clara, MS 1978 Utah State University.

FOLEY, BETH E. (1993) Assoc. Prof., Communicative Disorders and Deaf Education; Specialist, Center for Persons with Disabilities. BA 1975, MA 1976, PhD 1989 University of Massachusetts.

FOLKMAN, STEVEN LEE (1980) Assoc. Prof., Mechanical and Aerospace Engineering. BS 1975, MS 1978, PhD 1990 Utah State University.

FOLSOM, JACKIE R. (1990) Administrative Assistant, Center for Atmospheric and Space Sciences.

FONNESBECK, DOREEN (1994) Specialist, Center for Persons with Disabilities. BS 1994 Utah State University.

FOORD, EDEN (1993) Temp. Instr., Languages and Philosophy. BA 1987 California Polytechnic State University, MA 1990 California State University (Chico).

FORD, HARRY A. (1995) Temp. Asst. Prof., Sociology, Social Work and Anthropology. BA 1970 Michigan State University, MSW 1990, MA 1995, PhD 1995 University of Michigan.

FORSGREN-WHITE, JOAN F. (1970) Clinical Instr., Special Education and Rehabilitation. BS 1966, MEd 1968 Utah State University.

FORSTER, CRAIG B. (1986) Adjunct Assoc. Prof., Geology. BS 1975 University of British Columbia, MS 1979 University of Waterloo, PhD 1987 University of British Columbia.

FORSYTH, KAY W. (1990) Specialist, Center for Persons with Disabilities. BA 1971 University of Akron, MSW 1973 Ohio State University.

FOSTER, JOHN C. (1983) Adjunct Prof., Physics. BS 1967 Boston College, MS 1969, PhD 1973 University of Maryland.

FOXLEY, CECELIA HARRISON (1981) Assoc. Commissioner for Academic Affairs; Prof., Psychology. BA 1964 Utah State University, MA 1965, PhD 1968 University of Utah.

FRAME, DAVID D. (1991) Adjunct Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1980 Utah State University, DVM 1984 Oregon State University, DVM 1984 Washington State University.

FRANCIS, MARK G. (1989) Ext. Program Associate, Rangeland Resources. BS 1987 Texas A&M University.

FRANKLIN, MICHAEL R. (1984) Adjunct Prof., Animal, Dairy and Veterinary Sciences. BS 1966 University of Birmingham, England, PhD 1969 University of London, England.

FRASER, MARY E. (1992) Adjunct Clinical Instr., Special Education and Rehabilitation. BSSW 1976 Metropolitan State College (Denver), MPA 1988, DSW 1988 University of Utah.

FREDEN, ERIC M. (1994) Ext. Asst. Prof., Uintah Basin Branch Campus, Continuing Education. BA 1988 Reed College, MS 1990 Portland State University, PhD 1994 Brigham Young University.

FRESTON, JANET L. (1991) Adjunct Clinical Instr., Special Education and Rehabilitation. BS 1969 Bradley University (Peoria), MS 1973 University of Utah.

FRIDLEY, VERNON A. (1990) Adjunct Asst. Prof., Forest Resources. BS 1961 Oregon State University.

FRIEDMAN, SUSAN G. (1995) Research Asst. Prof., Psychology. BA 1975 New England College, MEd 1981 Plymouth State College, PhD 1985 Utah State University.

FRONK, THOMAS H. (1990) Assoc. Prof., Mechanical and Aerospace Engineering. BS 1985 Utah State University, MS 1988, PhD 1991 Virginia Polytechnic University.

FRONSKE, HILDA (1990) Asst. Prof., Health, Physical Education and Recreation. BS 1974 University of Arizona, MS 1979 Arizona State University, EdD 1988 Brigham Young University.

FUGAL, KARL A. (1967) Director, Computer Services. BS 1964, MS 1970 Utah State University.

FUHRIMAN, JERRY W. (1971) Prof., Landscape Architecture and Environmental Planning. BLA 1966 Utah State University, MLA 1968 University of Illinois.

FULLERTON, HERBERT H. (1969) Prof. and Economist—Water Policy, Economics; Director, Economics Research Institute. BS 1961, MS 1966 Utah State University, PhD 1971 Iowa State University.

FULLERTON, ROSEMARY R. (1990) Adjunct Lecturer, School of Accountancy. BA 1970 Brigham Young University, BS 1985, MAcc 1989 Utah State University, CPA 1986 State of Utah.

FULLMER, JACKIE W. (1973) Adviser, Student Productions, Student Services. BS 1959 University of Utah, MS 1965 Utah State University.

FULLMER, R. REES (1990) Assoc. Prof., Mechanical and Aerospace Engineering. BS 1976, MS 1983, PhD 1985 University of Utah.

FUNDA, EVELYN I. (1995) Asst. Prof., English. BA 1984, MA 1986 Boise State Unversity, PhD 1994 University of Nebraska (Lincoln).

FUNK, STEPHEN P. (1993) Computer Specialist, Computer Services. BS 1993 Utah State University.

FURCH, DEREK (1982) Director, Programs and Entertainment, Student Services. BA 1980 Weber State College, MA 1982 Brigham Young University.

FURLONG, WILLIAM LEON (1968) Prof., Political Science. BA 1962, MA 1963 University of Utah, PhD 1967 University of Florida.

FURNISS, ANNA L. (1995) Marketing Manager, USU Press and Scholarly Publications. BS 1994 Utah State University.

GALDERISI, PETER F. (1979) Assoc. Prof., Political Science. BA 1973, MA 1978, PhD 1981 Cornell University.

GALE, JODY A. (1988) Ext. Asst. Prof. and Agriculture Agent (Millard), University Extension. BS 1986, MS 1988 Utah State University.

GALLOWAY, PARL (1982) Temp. Instr., Animal, Dairy and Veterinary Sciences. BS 1968 Southern Utah State College, MS 1971 Utah State University.

GARDNER, DALE R. (1995) Adjunct Research Assoc. Prof., Animal, Dairy and Veterinary Sciences. BS 1983 Cedarville College, PhD 1987 Colorado State University.

GARDNER, PATRICIA (1962) Assoc. Prof., English. BS 1961, MS 1962 Utah State University, DA 1981 Idaho State University.

GARDNER, WILFORD R. (1995) Adjunct Prof., Plants, Soils, and Biometeorology. BS 1949 Utah State University, MS 1951, PhD 1953 Iowa State University (Ames).

GARNER, DENNIS (1989) Ext. Asst. Prof., Uintah Basin Branch Campus, Continuing Education. BS 1976, MS 1979 Brigham Young University.

GAST, JULIE A. (1994) Asst. Prof., Health, Physical Education and Recreation. BA 1989, MA 1991, PhD 1994 Southern Illinois University.

GAY, CHARLES W. (1983) Asst. to the Dean for Administrative Affairs and Ext. Program Leader, College of Natural Resources; Ext. Assoc. Prof., Rangeland Resources; International Programs Coordinator, College of Natural Resources. BS 1962, MS 1964 Oklahoma State University.

GAYNARD, LAURA LEE (1984) Research Associate, Center for Persons with Disabilities. BS 1976 San Diego State University, MS 1980 Utah State University.

GEERTSEN, HAROLD REED (1972) Prof., Sociology, Social Work and Anthropology. BS 1965, MS 1968, PhD 1971 University of Utah.

GENSEL, GREGG B. (1988) Head Coach, Men's and Women's Track and Field, Intercollegiate Athletics. BS 1981, MS 1988 Utah State University.

GENTRY, STEVEN M. (1995) Adjunct Clinical Asst. Prof., Psychology. BS 1987 Brigham Young University, MS 1990, PhD 1993 University of Louisville.

GEORGE, MICHAEL A. (1995) Accountant, Physical Plant. BS 1995 Utah State University.

GEORGE, SCOTT R. (1990) Adjunct Instr., Landscape Architecture and Environmental Planning. BA 1983 Humboldt State University, MA 1988 California State University.

GERITY, PETER F. (1994) Vice President for Research. BS 1965 Delaware Valley College (Pennsylvania), MS 1970, PhD 1971 Virginia Polytechnic Institute and State University (Blacksburg, Virginia).

GESE, ERIC M. (1995) Research Asst. Prof., Fisheries and Wildlife. BS 1982 University of Texas (San Antonio), MS 1987, PhD 1995 University of Wisconsin (Madison).

GESSAMAN, JAMES A. (1968) Prof., Biology. BA 1962 Earlham College, MS 1964, PhD 1968 University of Illinois.

GHAFOURIAN, MOHAMMAD ALI (1991) Adjunct Asst. Prof., Electrical and Computer Engineering. BS 1980, MS 1982, PhD 1990 Utah State University.

GHOSH, BISHNUPRIYA (1993) Asst. Prof., English; Adjunct Prof., Languages and Philosophy. BA 1985 Presidency College, BA 1987 Wellesley College, MA 1990, PhD 1993 Northwestern University.

GHOSH, SANTIBRATA (1993) Research Prof., Biological and Irrigation Engineering. MS 1948, PhD 1956 University College of Science (Calcutta, India).

GIARELLI, ANDREW (1988) Adjunct Asst. Prof., Communication. BA 1975 Yale University, PhD 1984 Southern University of New York (Buffalo).

GIBBONS, ANDREW S. (1993) Assoc. Prof. and Research Scientist, Instructional Technology. BA 1969, PhD 1974 Brigham Young University.

GILBERT, BARRIE K. (1976) Asst. Prof. and Senior Scientist, Fisheries and Wildlife. BA 1962 Queen's University (Kingston), MA 1964, PhD 1970 Duke University.

GILES, CHRISTOPHER (1987) Teacher of Piano, Music. BM 1978 Brigham Young University, MM 1981 Indiana State University.

GILLILAND, ROBERT L. (1992) Vice President for University Extension and Continuing Education; Prof., Agricultural Systems Technology and Education. BS 1966 University of Arizona, MA 1972 Arizona State University, PhD 1978 Ohio State University.

GIMPEL, GRETCHEN A. (1995) Asst. Prof., Psychology. BA 1990 College of William and Mary, MA 1992, PhD 1995 University of South Carolina.

GINN, JON STEPHEN (1995) Research Associate, Utah Water Research Laboratory. BS 1987, MS 1990 Texas A&M University (College Station), PhD 1996 Utah State University.

GITTINS, JANA M. (1990) Senior Accountant, Administrative Affairs.

GITTINS, RODNEY LEE (1973) Analyst/Programmer, Computer Services. BS 1972 Utah State University.

GLASS, JOHN E. (1995) Assoc. Athletic Director for External Operations, Institutional Development. BS 1975 University of Georgia.

GLASS-COFFIN, BONNIE (1993) Asst. Prof., Sociology, Social Work and Anthropology. BA 1980 Whitman College, MA 1985, PhD 1992 University of California (Los Angeles).

GLATFELTER, MARILYNNE T. (1973) Clinical Asst. Prof., Psychology. BA 1963 Knox College, MS 1966, EdS 1970 Indiana University, PhD 1982 University of Minnesota.

GLATFELTER, R. EDWARD (1970) Assoc. Dean—Administrative Affairs and Ext. Program Leader, Humanities, Arts and Social Sciences; Prof., History; Adjunct Prof., Languages and Philosophy. BA 1963 Whitman College, MA 1968, PhD 1975 Indiana University.

GLEDHILL, BRENT L. (1980) Ext. Assoc. Prof and Ext. Horticulturist, Utah County Office, University Extension; Ext. Asst. Prof., Plants, Soils, and Biometeorology. BS 1964 Brigham Young University, MS 1978 University of California (Davis).

GLIMP, HUDSON A. (1988) Adjunct Prof., Animal, Dairy and Veterinary Sciences. BS 1960, MS 1962 Texas A&M, PhD 1964 Oklahoma State University.

GLOVER, BARBARA (1993) Research Instr., Communicative Disorders and Deaf Education. BS 1967, MS 1990 Utah State University.

GLOVER, TERRENCE F. (1974) Prof., Economics. BS 1965, MS 1966 Utah State University, PhD 1971 Purdue University.

GOBENA, AMANUEL (1985) Research Associate, Rangeland Resources. BS 1977 Addis Ababa, Ethiopia, MS 1983 Utah State University.

GOBLE, E. MARLOWE (1988) Adjunct Prof., Animal, Dairy and Veterinary Sciences. BS 1971 University of Utah, MD 1976 Washington University.

GODFREY, ERIK BRUCE (1977) Prof. and Ext. Specialist, Economics. BS 1967, MS 1968 Utah State University, PhD 1971 Oregon State University.

GOEDE, RONALD W. (1966) Adjunct Asst. Prof., Fisheries and Wildlife; Director, State of Utah Division of Wildlife Resources Experimental Hatchery. BS 1957 University of Nebraska, MS 1961 Utah State University.

GOETZE, DAVID B. (1983) Assoc. Prof. and Graduate Program Coordinator, Political Science. BA 1977, MA 1979 Kansas University, PhD 1980 Indiana University.

GOETZE, LINDA DIANE (1989) Research Assistant, Center for Persons with Disabilities. BA 1978 Indiana University, MS 1987 Utah State University.

GOGUE, G. JAY (1995) Provost of Utah State University; Prof., Forest Resources. BS 1969, MS 1970 Auburn University, PhD 1973 Michigan State University.

GOLIGHTLY-MICHAEL, AMY (1995) Specialist, Center for Persons with Disabilities. BS 1990 Radford University, MSW 1993 Virginia Commonwealth University.

GOODE, DONN C. (1960) Research Asst. Prof., Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1963, MS 1969 Utah State University.

GOODHART, LYNNE HOWARD (1974) Assoc. Prof., Languages and Philosophy. BA 1960 University of Utah, MA 1965, PhD 1970 University of Colorado.

GOODRICH, L. BRUCE (1987) Ext. Asst. Prof. and Adviser—Students, Uintah Basin Branch Campus, Continuing Education. BS 1963 Brigham Young University, MS 1968 University of Utah.

GOODSTEIN, DAVID (1995) Asst. Prof., Physics. BS 1982 New York University, MS 1985, PhD 1990 Cornell University. LWOP 1995-96 academic year.

GOODWIN, JERRY L. (1990) Lecturer, Industrial Technology and Education.

GOODWIN, ROBERT SCOTT (1988) Manager—Carpentry, Construction, Maintenance, and Repair, Physical Plant.

GOONAN, THOMAS M. (1991) Specialist, Center for Persons with Disabilities. BFA 1982 Kansas City Art Institute.

GOOSTREE, LYNN H. (1994) Program Coordinator, Field Staff, University Extension. BS 1994 Utah State University.

GOOT, HENRY (1980) Adjunct Research Prof., International Sheep and Goat Institute, Animal, Dairy and Veterinary Sciences. B Agr Sc 1939, M Agr Sc 1941 University of New Zealand, PhD 1966 Hebrew University.

GORDIN, RICHARD D., Jr. (1981) Prof. and Graduate Program Coordinator, Health, Physical Education and Recreation; Adjunct Prof., Psychology. BA 1973 Ohio Wesleyan University, MA 1973 Ohio State University, EdD 1981 University of Utah.

GORDON, DONNA LEE (1980) Assoc. Prof., Health, Physical Education and Recreation. BS 1967 Illinois State University, MFA 1972 University of Utah.

GORDON, THOMAS J. (1983) Manager of Contract Documentation, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BA 1981, MA 1983 Utah State University.

GORHAM, ELIZABETH ELLEN (1976) Asst. Prof., Human Environments; Family Resource Management Specialist, University Extension. BS 1968 Iowa State University, MS 1971 Utah State University, PhD 1992 Oregon State University.

GOYEN, KENNETH D. (1988) Subcontract Administrator, Business Service Center, USU Research Foundation.

GRANGE, E. VANCE (1978) Asst. Prof., School of Accountancy. BA 1972 Brigham Young University, MAcc 1976 Utah State University, PhD 1983 University of Texas (Austin).

GRANGE, LEILANI (1988) Adjunct Lecturer, Biology. BS 1967 Weber State College.

GRANT, MICHELLE (1990) Teacher, Edith Bowen Laboratory School; Adjunct Prof., Elementary Education. BA 1987, MEd 1990 Utah State University.

GRANT-DAVIE, KEITH A. (1991) Asst. Prof., English. BA 1979 University of Exeter (England), MA 1980, C. Phil 1983, PhD 1985 University of California (San Diego).

GREEN, MILTON E. (1995) Ext. Assoc. Prof. and Area Economic Development Agent, University Extension. BS 1974, MEd 1988 University of Wyoming.

GREENE, JUDY H. (1995) Temp. Instr., Elementary Education. BS 1968, MS 1990 Utah State University.

GRENNEY, WILLIAM JAMES (1972) Prof., Civil and Environmental Engineering and Utah Water Research Laboratory. BS 1960 Michigan Technological University, MS 1970, PhD 1972 Oregon State University, PE.

GRIER, CHARLES C. (1991) Adjunct Prof., Forest Resources. BS 1968, PhD 1972 University of Washington.

GRIFFIN, DENNIS D. (1973) Asst. Dept. Head, Assoc. Prof., and Director of Symphonic/Marching Band, Music. BM 1968, MM 1969 Utah State University, PhD 1984 Brigham Young University.

GRIFFIN, LOUIS D. (1966) Director, Com-Net Services and Enrichment Class Programs, Continuing Education. BS 1964, MS 1971 Utah State University.

GRIMAUD, GEHRI DON (1988) Systems Specialist, Computer Services, Mathematics and Statistics. BS 1988 Utah State University.

GROOME, JAMES RICHARD (1989) Postdoctoral Fellow, Biology. BA 1981 Wake Forest University, PhD 1988 University of New Hampshire.

GROSHART, NANCY L. (1985) Adjunct Lecturer, Biology. BS 1976 University of Wyoming.

GROSSL, PAUL R. (1994) Asst. Prof., Plants, Soils, and Biometeorology. BS 1981 University of Illinois, MS 1985 University of Minnesota, PhD 1991 Montana State Unversity.

GROVER, KEVIN L. (1995) Computer Specialist, Computer Services.

GROVER, THOMAS A. (1985) Research Asst. Prof., Chemistry and Biochemistry; Senior Research Scientist, Utah Agricultural Experiment Station. BS 1968, MS 1970 California State University (Los Angeles), PhD 1974 University of Hawaii.

GRUTZMACHER, JIMMIE M. (1991) Supervisor—Personnel, Physical Plant.

GUBALA, CHAD P. (1995) Research Asst. Prof. and Assoc. Director of INSE, Utah Water Research Laboratory. BS 1982 Lehigh University, MS 1985, PhD 1988 Indiana University.

GUENTER-SCHLESINGER, SUE H. (1991) Director, Affirmative Action/Equal Opportunity Office; Adjunct Asst. Prof., Sociology, Social Work and Anthropology. BA 1972, MA 1974, PhD 1979 University of California (Los Angeles).

GUNDERSON, ROBERT W. (1968) Prof., Electrical and Computer Engineering. BSEE 1958 Montana State University, MA 1962, PhD 1967 University of Alabama.

GUO, XIANGDONG (1994) Adjunct Research Asst. Prof., Computer Science. BS 1984 Naikai University, MS 1987, PhD 1994 Beijing Agricultural University.

GUPTA, VIJAY K. (1987) Adjunct Research Prof., Utah Water Research Laboratory. BE 1967 University of Roorkee (India), MS 1971 Colorado State University, PhD 1973 University of Arizona.

GUTKNECHT, KURT W. (1983) Editor, UAES Information Office, Utah Agricultural Experiment Station. BS 1972, MS 1980 University of Wisconsin.

GUTSHALL, NANETTE (1989) Specialist, Center for Persons with Disabilities. BS 1983 Utah State University.

GUY, STANLEY M. (1992) Ext. Asst. Prof. and Community Development Specialist, University Extension. BS 1979, MS 1985 Utah State University.

HADLEY, KARELYN (1983) Adjunct Lecturer, Biology. BS 1974 Brigham Young University, BS 1975 Boise State University.

HADLEY, TED W. (1995) Library Systems Specialist, Library and Information Services, Learning Resources Program. BA 1993, MA 1995 Utah State University.

HAEFNER, JAMES W. (1984) Assoc. Prof., Biology. BS 1969 University of Washington, MS 1972, PhD 1975 Oregon State University.

HAILEY, CHRISTINE E. (1994) Asst. Prof., Mechanical and Aerospace Engineering. BS 1977 Colorado State University, MS 1981, PhD 1985 University of Oklahoma.

HAILEY, DAVID E., Jr. (1994) Temp. Asst. Prof., English. BA 1974 University of Puget Sound, MA 1990, PhD 1994 University of New Mexico.

HALAUFIA, PATRICIA A. (1994) Asst. Director, Alumni Relations. BS 1977 Utah State University.

HALL, JAMES L. (1994) Library Systems Specialist, Library and Information Services, Learning Resources Program. BS 1994 Utah State University.

HALL, MARINA L. (1992) Temp. Lecturer, English. BA 1988 Weber State College, MA 1991 Utah State University.

HALL, SHANNA MARIE (1990) Specialist, Center for Persons with Disabilities. CDA 1985 Banks College.

HALLENBECK, BETTY A. (1994) Asst. Prof., Special Education and Rehabilitation. BA 1982 Carleton College, MEd 1985, PhD 1994 University of Virginia.

HALLIDAY, MICHAEL V. (1988) Adjunct Instr., Health, Physical Education and Recreation. BS 1975 Brigham Young University, MS 1979 Texas Woman's University/Baylor University.

HALLING, MARVIN W. (1994) Asst. Prof., Civil and Environmental Engineering. BS 1985 Utah State University, MS 1986 Stanford University, PhD 1994 California Institute of Technology.

HAMBLY, KELLEEN S. (1985) Specialist—Dissemination, Center for Persons with Disabilities. BS 1983 Utah State University.

HAMMON, DOUGLAS S. (1994) Clinical Veterinary Intern, Animal, Dairy and Veterinary Sciences. BS 1990 Weber State University, DVM 1994 Washington State University.

HAMMOND, BETTY (1980) Teacher of Voice and Piano, Music. BA 1968 Utah State University, BA 1974, MM 1976 Brigham Young University.

HAMMOND, MARILYN (1991) Specialist, Center for Persons with Disabilities. BS 1977, MS 1990 Utah State University.

HANCOCK, "H" K. (1973) Director, Credit Programming and Evening School, Continuing Education; Assoc. Prof., Forest Resources. BS 1958, BS 1960 University of Kansas, MS 1969 University of Missouri, PhD 1971 Utah State University.

HANDY, GLADE L. (1984) Manager, Campus Service Station, Physical Plant. BS 1960 Utah State University.

HANKS, STEVEN H. (1988) Assoc. Prof., Management and Human Resources; Assoc. Prof., Class Division, Continuing Education. BS 1979 Utah State University, MS 1982, MBA 1987, PhD 1990 University of Utah.

HANNA, STEVEN C. (1992) Teacher, Edith Bowen Laboratory School. BS 1976 Brigham Young University, MEd 1988 Seattle Pacific University.

HANSEN, ARLEN L. "TED" (1957) Manager; Photography Service; Asst. Prof., Learning Resources Program. BS 1952, MS 1958 Utah State University.

HANSEN, BARRY (1985) Teacher of Guitar, Music. BM 1985, MS 1988 Utah State University.

HANSEN, CONLY L. (1985) Prof., Nutrition and Food Sciences, Biological and Irrigation Engineering. BS 1972, ME 1973 Utah State University, PhD 1980 Ohio State University.

HANSEN, DANE R. (1990) Senior Research Associate, Biology. BA 1971 University of Utah, MS 1975, PhD 1980 Utah State University.

HANSEN, DAVID V. (1983) Asst. Manager—Operations, Bookstore, Auxiliary Enterprises. BS 1977 Utah State University.

HANSEN, ELOISE C. (1991) Registered Nurse, Student Health Services. BS 1956 Utah State University.

HANSEN, GARY B. (1967) Prof., Economics, Management and Human Resources; Director, Business and Economic Development Services; Coordinator of International Programs, College of Business. BS 1957, MS 1963 Utah State University, PhD 1971 Cornell University.

HANSEN, HEATHER H. (1987) Salt Lake County Agent (Youth), University Extension. BS 1983, MACEd 1986 Washington State University.

HANSEN, J. STEVEN (1992) Research Assoc. Prof., Physics; Research Assoc. Prof., Electrical and Computer Engineering; Supervisor, Computational Sciences Division, Space Dynamics Laboratory, USU Research Foundation. BA 1971 University of Utah, MS 1988 Johns Hopkins University (Baltimore), PhD 1975 Durham University (Durham, England).

HANSEN, KAREN UDY (1990) Specialist, Center for Persons with Disabilities. BS 1963 University of Utah.

HANSEN, KAY W. (1991) Outreach/Training Specialist, Communicative Disorders and Deaf Education. BS 1986, MS 1991 Utah State University.

HANSEN, ROGER DENNIS (1991) Adjunct Asst. Prof., Civil and Environmental Engineering. BS 1970 Brigham Young University, PhD 1979 Utah State University.

HANSEN, WILFORD N. (1968) Prof., Physics; Adjunct Prof., Chemistry and Biochemistry. BS 1950 Brigham Young University, PhD 1956 Iowa State University.

HANSON, JANET (1993) Academic Adviser, College of Engineering. BS 1992 Utah State University.

HARBAUGH, ROSS (1987) Adjunct Assoc. Prof., Music. BA 1971, BM 1973 Bowling Green State University.

HARDEE, DAVID B. (1995) Assoc. Director, Media Relations, Intercollegiate Athletics. BA 1991 Auburn University.

HARDESTY, LINDA HOWELL (1982) Research Associate, Rangeland Resources. BS 1974 University of Idaho, MS 1982 Utah State University.

HARDY, SHERRIE LYNN (1978) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1972, MS 1978 Utah State University.

HARDY, THOMAS BYRON (1988) Assoc. Prof., Civil and Environmental Engineering. BS 1977, BS 1978, MS 1982 University of Nevada (Las Vegas), PhD 1988 Utah State University.

HARRELSON, BETTY FRANKLIN (1995) Asst. Director, Affirmative Action/Equal Opportunity. BS 1968, MS 1970 Texas A&M University.

HARMON, MARLIN C. (1990) Adjunct Asst. Prof., Nutrition and Food Sciences. BS 1976, MS 1981 Brigham Young University; PhD 1983 Purdue University.

HARMSTON, RICHARD K. (1988) Adjunct Prof., Elementary Education. BA 1969 Colorado State University, MA 1974 University of Utah, PhD 1987 University of Michigan.

HARRIMAN, ANTHONY M. (1995) Assoc. Prof., Chemistry and Biochemistry. BS 1970, MSc 1971, PhD 1974 Wolverhampton Polytechnic University.

HARRIS, CHARLES R. (1978) Research Physicist, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BA 1968 Columbia College.

HARRIS, CHARLOTTE R. (1994) Specialist, Center for Persons with Disabilities.

HARRIS, JUDY L. (1987) Ext. Asst. Prof. and Utah County Agent (Home Economics), University Extension. BS 1971 Brigham Young University, MS 1974 Colorado State University.

HARRIS, LEE OWEN (1986) Library Systems Manager, Library Services, Learning Resources Program. BS 1986 Utah State University.

HARRIS, LYNNETTE F. (1991) Research/Science Writer, Information News Services. BS 1988 Utah State University.

HARRIS, RICHARD W. (1986) Dept. Head and Prof., Electrical and Computer Engineering. BS 1962, MS 1964, PhD 1966 Utah State University.

HARRIS, RONNEY D. (1964) Prof., Electrical and Computer Engineering and Center for Atmospheric and Space Sciences. BS 1954, PhD 1964 University of Utah.

HARRISON, JAY S. (1988) Subcontract Administrator, Business Service Center, USU Research Foundation.

HART, ANDREA D. (1995) Field Interviewer Supervisor, Cache County Memory Study, College of Family Life. BA 1991, MS 1994 Utah State University.

HART, DAVID F. (1975) Director, Career Services and Cooperative Education, Student Services. BS 1964, MS 1968 Utah State University.

HART, DOUGLAS (1967) Clinical Instr., Communicative Disorders and Deaf Education. BS 1953, MD 1956 University of Utah.

HART, SCOTT A. (1993) NEXUS Projects Co-director and Instr., Instructional Technology. BS 1989, MS 1993 Utah State University.

HARTMAN, CATHY L. (1992) Asst. Prof., Business Administration. BA 1970 Pittsburg State University, MA 1973 Wichita State University, PhD 1991 University of Colorado.

HARTMAN, LAIRD MAX (1984) Director and Assoc. Prof., Uintah Basin Branch Campus (Roosevelt), Continuing Education. BS 1968, MS 1970 Brigham Young University, PhD 1976 University of Montana.

HASHIMOTO, JAY ALAN (1988) Asst. Prof., Art. BFA 1976 Utah State University.

HASSAN, DENNIS (1993) Asst. Prof., Theatre Arts. BFA 1990 Utah State University, MFA 1993 Ohio State University.

HATCH, ANTHONY H. (1981) Prof., Plants, Soils, and Biometeorology; Utah County Agent (Horticulture), University Extension. BS 1965 Brigham Young University, MS 1968 Utah State University, PhD 1970 Cornell University.

HATCH, DUANE L. (1982) County Chair and Ext. Agent—Horticulture, Salt Lake County, University Extension. BS 1950 Utah State University, MS 1973 Oregon State University.

HAVEN, A. JOAN (1989) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1976 Brigham Young University.

HAVERTZ, C. MARLENE (1988) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1956 University of Utah.

HAWKINS, CHARLES PATRICK (1983) Prof., Fisheries and Wildlife. BS 1973, MA 1975 California State University, PhD 1982 Oregon State University.

HAWKS, LEONA K. (1979) Assoc. Dean for Extension, College of Family Life; Prof. and Ext. Housing Specialist, Human Environments. BS 1977, MS 1979 Utah State University, EdD 1984 Brigham Young University.

HAWKS, STEVEN R. (1991) Asst. Prof., Health, Physical Education and Recreation. BA 1982, MA 1985, MBA 1985, EdD 1990 Brigham Young University.

HAYCOCK, RALPH H. (1969) Prof., Mechanical and Aerospace Engineering; Supervisor, Mechanical Systems Laboratory, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1962, MS 1968 University of Utah, PhD 1973 Utah State University, PE.

HAYES, BERNARD L. (1973) Prof., Elementary Education. BS 1969 Ball State University, MA 1971 University of Arizona, EdD 1973 Ball State University.

HAYES, PATRICIA (1995) Ext. Instr.—Mathematics, Uintah Basin Branch Campus, Continuing Education. BS 1986, MEd 1995 Utah State University.

HAYWOOD, MARY PAT (1989) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1986, MS 1987 University of Nebraska.

HEAL, E. ROBERT (1971) Assoc. Prof., Mathematics and Statistics. BS 1965, PhD 1971 University of Utah.

HEALEY, MARK CALVIN (1981) Asst. Dept. Head and Prof., Animal, Dairy and Veterinary Sciences; Adjunct Prof., Biology. BS 1972, MS 1973 University of Utah, PhD 1976 Purdue University, DVM 1981 Mississippi State University.

HEAP, HAROLD E. (1993) Undergraduate Adviser, Secondary Education. BM 1970 University of Iowa, MA 1974 Eastern Illinois University, PhD 1980 University of Illinois.

HEDRICH, ANNE E. (1992) Asst. Librarian, Library and Information Services, Learning Resources Program. BS 1986, MA 1990 University of Wisconsin (Madison).

HEIKKINEN, MICHAEL WAYNE (1991) Prof., Secondary Education. BS 1968 University of Wisconsin (Madison), MS 1974, PhD 1977 University of Idaho.

HEINRICH, KATHRINE K. (1988) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1988 Utah State University.

HEINS, A. EDWARD (1991) Adjunct Assoc. Prof., Communication. BS 1953 University of Wisconsin (Madison).

HEISTER, CARLA G. (1992) Senior Librarian, S. J. and Jessie E. Quinney Natural Resources Research Library and Senior Research Associate, College of Natural Resources. BS 1979, MALS 1982 Northern Illinois University, MS 1989 University of Illinois.

HELD, ROGER (1993) Asst. Prof., Theatre Arts. BA 1967 University of Toledo, MA 1967 University of Michigan (Ann Arbor), PhD 1977 Bowling Green State University.

HEMPHILL, LEAUNDA S. (1991) Writer/Editor, Utah Water Research Laboratory. BS 1991 Utah State University, BS 1991 University of Missouri (Columbia).

HENDERSON, ANN E. (1983) Ext. Instr. and Box Elder County Agent (Home Economics), University Extension. BS 1977 Brigham Young University.

HENDRICKS, DELOY G. (1967) Prof. and Ext. Specialist, Nutrition and Food Sciences. BS 1961 University of Idaho, PhD 1967 Michigan State University.

HENDRICKS, HAVEN B. (1977) Assoc. Prof. and Ext. Specialist (Animal Science), Animal, Dairy and Veterinary Sciences. BS 1966 University of Idaho, MS 1969, PhD 1972 Purdue University.

HENDY, LINDA S. (1994) Executive Director of Auxiliaries, Administrative Affairs Office. BA 1976 University of Illinois, MBA 1983 University of Tennessee (Chattanooga).

HENNINGSEN, AMY H. (1992) Physical Therapist, Center for Persons with Disabilities. BS 1974 Eastern Michigan University.

HERLIHY, ALAN T. (1987) Adjunct Assoc. Prof., Utah Water Research Laboratory. BA 1981 Northwestern University, MS 1984, PhD 1987 University of Virginia.

HERZBERG, ROBERTA Q. (1993) Assoc. Prof., Political Science; Administrative Director, Institute of Political Economy. BA 1977 Pomona College, PhD 1982 Washington University.

HESS, JAMES P. (1992) Specialist, Center for Persons with Disabilities. BS 1968 Utah State University.

HESTIR, KEVIN (1990) Assoc. Prof., Mathematics and Statistics. BS 1977, MS 1979 New Mexico Institute of Mining and Technology, PhD 1986 University of California (Berkeley).

HEWITT, DAVID G. (1995) Postdoctoral Fellow, Fisheries and Wildlife. BS 1987 Colorado State University, MS 1989 Washington State University, PhD 1994 Virginia Polytechnic Institute and State University.

HICKEN, JAY C. (1968) Prof., Industrial Technology and Education. BS 1963 Brigham Young University, MS 1967 Stout State University, PhD 1977 Colorado State University.

HIGHAM, EUGENE DELMAR (1983) Buyer, Purchasing. BS 1975 Utah State University.

HILL, ROBERT W. (1971) Prof. and Ext. Specialist, Biological and Irrigation Engineering. BES 1967, MCE 1969 Brigham Young University, PhD 1973 Utah State University.

HILL, SPENCER H. (1987) Cost Scheduling Specialist, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1976, MBA 1977 Utah State University.

HILLS, NANCY ELIZABETH (1989) Assoc. Prof., Theatre Arts. BA 1973, MFA 1979 University of Oregon.

HILTON, THOMAS (1986) Assoc. Prof., Business Information Systems and Education. BA 1976, PhD 1982 Brigham Young University.

HINKAMP, DENNIS LEE (1980) Consumer Information Specialist, Information News Services; Information and Publications Specialist, University Extension. BS 1978, MS 1980 University of Missouri.

HINTON, ADRIAN C. (1989) Ext. Asst. Prof. and Washington County Agent, University Extension. BS 1972 University of Arizona, MS 1980 Arizona State University.

HINTON, MAURICE L. (1991) Manager, Carousel Square, Food Services, Auxiliary Enterprises.

HIPPS, LAWRENCE E. (1981) Assoc. Prof., Plants, Soils, and Biometeorology. BS 1975 North Illinois University, MS 1977 University of Nebraska, PhD 1981 University of California (Davis).

HISLOP, W. CRAIG (1972) News Writer/Producer and *Staff News* Editor, Information News Services; Reporter/Newscaster, KUSU-FM (Utah Public Radio). BS 1972 Utah State University.

HOBBS, DEBORAH E. (1990) Asst. Prof., Elementary Education. BS 1970, MACT 1976 Auburn University, PhD 1983 University of Nebraska.

HOBSON, COLLEEN M. (1995) Information Systems Specialist, Records Management Office.

HODGES, TERRY L. (1975) Associate Director, Personnel Services. BS 1973, MS 1983 Utah State University.

HOFMEISTER, ALAN M. (1969) Director—Technology, Center for Persons with Disabilities; Prof., Special Education and Rehabilitation, Instructional Technology; Adjunct Prof., Communication. BS 1965 University of Queensland, MS 1967, PhD 1969 University of Oregon.

HOGGAN, DANIEL H. (1968) Prof., Civil and Environmental Engineering. BS 1952 Utah State University, MS 1953 Stanford University, PhD 1969 Utah State University, PE.

HOLDREDGE, RUSSELL M. (1959) Prof., Mechanical and Aerospace Engineering. BS 1956, MS 1959 University of Colorado, PhD 1965 Purdue University, PE.

HOLE, DAVID JAY (1990) Asst. Prof., Plants, Soils, and Biometeorology. BS 1980 Texas A&M University, MS 1983 Iowa State University, PhD 1988 Texas A&M University.

HOLMES, ARTIE L. (1995) Asst. Football Coach, Intercollegiate Athletics. BS 1989 Washington State University.

HOLMES, DALLAS LLOYD (1972) Director of Professional Continuing Education and Outreach Programs, Continuing Education; Assoc. Prof., University Extension and Continuing Education. BS 1968, MEd 1969, EdD 1971 Utah State University.

HOLMES, ERIC (1990) Teacher, Edith Bowen Laboratory School. BA 1987 Utah State University.

HOLMGREN, LYLE (1990) Ext. Asst. Prof. and Box Elder County Agent, University Extension. BS 1987, MS 1988 Utah State University.

HOLT, MARK B. (1993) Electrical Engineer, Campus Planning and Engineering. BS 1991 Utah State University.

HOLYOAK, GILBERT REED (1992) Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1983, MS 1984 Brigham Young University, DVM 1988 Washington State University, PhD 1991 University of Kentucky.

HOLZ, RICHARD C. (1992) Asst. Prof., Chemistry and Biochemistry. BS 1984 Bemidji State University, MS 1986 University of Minnesota (Deluth), PhD 1989 Pennsylvania State University.

HOMER, COLLIN (1990) Research Associate, Fisheries and Wildlife. BS 1986 Weber State College, MS 1990 Utah State University.

HONE, DEENA N. (1995) Prevention Specialist, Office of Substance Abuse Prevention/Education. BS 1995 Utah State University.

HONMA, CHIYO (1981) Teacher of Piano, Music. Graduate 1971 Toho Academy University (Japan).

HOOD, ELIZABETH E. (1988) Adjunct Asst. Prof., Biology. BA 1974 University of Oklahoma (Norman), MS 1980 Oklahoma State University (Stillwater), PhD 1985 Washington University (St. Louis).

HOOD, JAMES L. (1984) Mechanical Engineer, Engineering and Planning, Physical Plant. BS 1973 University of Illinois, MS 1983 University of Utah.

HOPKIN, MARGARET H. (1993) Ext. Instr. and Morgan County Agent, University Extension. BS 1971 Brigham Young University.

HOPKINS, CRAIG A. (1995) Equipment Supervisor, Intercollegiate Athletics. BS 1994 University of Nevada (Las Vegas).

HOSIN, LEE (1993) Adjunct Asst. Prof., Civil and Environmental Engineering. BS 1980 Seoul National University, MS 1981 Stanford University, PhD 1985 University of Texas (Austin).

HOSKINS, SHANNON R. (1987) Assoc. Director, Mountain West Center for Regional Studies, History. BS 1962 Utah State University, MS 1969 University of Utah.

HOTH, LADELL C. (1965) Senior Librarian, Assoc. Director for Media Services, Learning Resources Program; Asst. Prof., Instructional Technology. BS 1963 Utah State University, MLS 1965 Pratt Institute.

HOUSE, BARBARA A. (1988) Affiliate Librarian, Library and Information Services, Learning Resources Program. BA 1986, MLS 1987 University of Arizona.

HOUSTON, RONALD (1995) Adjunct Clinical Asst. Prof., Psychology. BS 1979 Southern Illinois University, MS 1986 Idaho State University, PhD 1995 New School for Social Research (New York, New York).

HOVEY, CLINTON (1988) Manager—Plumbing, Construction, Maintenance, and Repair, Physical Plant.

HOWELL, DONNA M. (1992) Asst. Prof., Aerospace Studies. BS 1988 Florida State University, MS 1991 Troy State University.

HOWELL, MARSHA (1990) Buyer, Purchasing.

HOWLETT, L. CARL (1970) Research Project Engineer and Adjunct Research Asst. Prof., Electrical and Computer Engineering and Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1966, MS 1970 University of Utah.

HSIAO, TING H. (1967) Prof., Biology. BS 1957 Taiwan Provincial College of Agriculture, MS 1961 University of Minnesota, PhD 1966 University of Illinois.

HUANG, CHIEN-MIN (1991) Adjunct Asst. Prof. and Senior Research Scientist, Electrical and Computer Engineering; Senior Engineer, Technical Research Laboratory, Space Dynamics Laboratory, USU Research Foundation. MS 1988, PhD 1991 Utah State University.

HUANG, JING (1994) Asst. Prof., Political Science; Adjunct Asst. Prof., Sociology, Social Work and Anthropology. BA 1978 Sichuan University (Chengdu, China), MA 1983 Fudan University (Shanghai, China), PhD 1994 Harvard University.

HUBBARD, JOHN L. (1989) Assoc. Prof., Chemistry and Biochemistry. BS 1976 University of Missouri, PhD 1982 University of Arizona.

HUBER, DON (1961) Assoc. Prof. and Cache County Agent, University Extension. BS 1960, MS 1962 Utah State University.

HUBER, LEO R. (1991) Satellite Engineer, Instructional Television, Multimedia and Distance Learning Services.

HUBER, MARK R. (1992) Systems Analyst, Center for Persons with Disabilities. BS 1987, MS 1990 Utah State University.

HUBER, PAUL E. (1985) Asst. to the Director, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1965 Arizona State University, MS 1980 Troy State University.

HUCKABY, CAROL J. (1987) Manager, Customer Service, Physical Plant.

HUCKABY, DAVID C. (1986) Facilities Manager, Physical Plant. BA 1967 California State University (Long Beach).

HUDSON, PAMELA J. (1988) Assoc. Prof.; Special Education and Rehabilitation. BS 1974, MS 1979 Florida International University, PhD 1987 University of Florida.

HUDSON, THOMAS (1988) Research Technologist, Stewart Radiance Laboratory, Space Dynamics Laboratory, USU Research Foundation.

HUENEMANN, CHARLES D. (1994) Asst. Prof., Languages and Philosophy. BA 1987, MA 1989 University of Wisconsin (Milwaukee), PhD 1994 University of Illinois (Chicago).

HUERTA, GRACE C. (1994) Asst. Prof., Secondary Education. BA 1981 University of Southern California, MA 1986 California State University (Los Angeles), PhD 1994 Arizona State University.

HUFFAKER, DALE C. (1982) Director of Service Enterprises/Real Property, Administrative Affairs. BS 1969 Brigham Young University, MBA 1979 Utah State University.

HUFFMAN, JOHN H. (1980) Research Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1960, MS 1969 Brigham Young University, PhD 1988 Utah State University.

HUGENTOBLER, MARC D. (1993) Instructional Designer, Instructional Television, Multimedia and Distance Learning Services. BS 1988, MS 1993 Utah State University.

HUGHES, BRONWYN G. (1991) Adjunct Research Assoc. Prof., Animal, Dairy and Veterinary Sciences. BS 1967, MS 1972, PhD 1977 Brigham Young University.

HUGHES, DAISY M. (1992) Specialist, Center for Persons with Disabilities. BS 1976, MS 1979 Utah State University.

HUGHES, JOANNE ELIZEBETH (1984) Research Asst. Prof., Biology. BS 1974 Carleton University, MS 1977, PhD 1981 Australian National University. LWOP 7-1-95 to 6-30-96.

HUGHES, RICKEY D. (1989) Chief Engineer, Audio and Video Engineering, Multimedia and Distance Learning Services.

HUGHES, TREVOR C. (1972) Prof., Civil and Environmental Engineering, Biological and Irrigation Engineering, Utah Water Research Laboratory; International Programs Coordinator, College of Engineering. BS 1957, PhD 1972 Utah State University, PE.

HUGIE, PAMELA E. (1989) Coordinator and Asst. Prof., WSU/USU Cooperative Nursing Program. BS 1971 University of Utah.

HUGIE, R. TODD (1993) Library Systems Specialist, Library and Information Services, Learning Resources Program. BS 1985 Utah State University.

HULT, CHRISTINE (1985) Prof. and Asst. Dept. Head, English; Editor, *Journal of the Council of Writing Program Administrators*. BA 1975, MA 1978 University of Idaho, PhD 1982 University of Michigan.

HUNSAKER, CAROLYN T. (1994) Adjunct Assoc. Prof., Rangeland Resources. BS 1974 Pacific Union College, MS 1976 Loma Linda University, PhD 1980 University of California (Los Angeles).

HUNSAKER, FRED R. (1991) Vice President for Administrative Affairs. BS 1965 Utah State University, PCBS 1976 University of Washington.

HUNSAKER, JENNIFER A. (1988) Adjunct Lecturer, Biology. BSN 1987 University of Utah.

HUNSAKER, SCOTT L. (1995) Asst. Prof., Elementary Education. BA 1977, MEd 1982 Brigham Young University, PhD 1991 University of Virginia.

HUNSAKER, TERESA (1980) Ext. Instr., County Chair, and Home Economics Agent (Weber), University Extension. BS 1979 Brigham Young University.

HUNTINGTON, MELISSA (1989) Cooperative Education Supervisor, Business Information Systems and Education. BS 1989 Utah State University.

HUPPI, JAMES W. (1990) Project Engineer/Surveyor, Campus Planning and Engineering. BLA 1978 Utah State University.

HUPPI, RONALD J. (1967) Research Assoc. Prof., Electrical and Computer Engineering; Division Manager, Stewart Radiance Laboratory, Space Dynamics Laboratory, USU Research Foundation. BS 1965, MS 1966 Utah State University.

HURST, CLYDE J. (1981) Ext. Assoc. Prof. and Sevier County Agent (Agriculture), University Extension. BS 1963, MS 1965 Utah State University, PhD 1970 University of Minnesota.

HURST, ROBERTA A. (1993) Specialist, Center for Persons with Disabilities. BA 1993 Utah State University.

HUTSON, GAYNELL JOHNSEN (1981) Adjunct Instr., Nutrition and Food Sciences. BS 1953 Utah State University, MS 1980 Utah State University.

HYDE, KYLE J. (1991) Asst. Director of Institutional Research, Budget Office. BS 1984, MS 1984 Brigham Young University.

HYDE, MARION R. (1968) Dept. Head and Assoc. Prof., Art. BS 1962, MFA 1968 Utah State University.

IMMEL, NANCY E. (1987) Specialist—Compliance and Lecturer, Center for Persons with Disabilities. BA 1968 Sacramento State College, BS 1976 Colorado State University.

INGERSOLL, JULIE MARIE (1978) Ext. Asst. Prof. and Kane County Agent, University Extension. BS 1974 Utah State University.

INNOCENTI, MARK S. (1987) Specialist—Research/Evaluation, Center for Persons with Disabilities; Research Asst. Prof., Psychology. BS 1972 Northeastern University, MS 1984 Utah State University.

IRUDAYARAJ, JOSEPH (1995) Asst. Prof., Biological and Irrigation Engineering, Nutrition and Food Sciences. BE 1983 Tamie Nadu Agricultural University (TNAU) (India), MS 1986, MS 1987 University of Hawaii (Honolulu), PhD 1990 Purdue University.

ISRAELSEN, BOYD P. (1988) Adjunct Prof., Electrical and Computer Engineering. BS 1952, MS 1953 California Institute of Technology, PhD 1960 Stanford University.

ISRAELSEN, GLEN A. (1990) Manager, Utah Dairy Herd Improvement Association, Animal, Dairy and Veterinary Sciences; Dairy Science Specialist, University Extension. BS 1957 Utah State University.

ISRAELSEN, JILLANN R. (1995) Operations Manager, Bookstore. BA 1983 Brigham Young University.

ISRAELSEN, L. DWIGHT (1980) Assoc. Prof., Economics. BA 1969 Utah State University, PhD 1973 Massachusetts Institute of Technology.

ISRAELSEN, PAUL D. (1984) Research Asst. Prof., Electrical and Computer Engineering. BS 1982 Utah State University, MS 1985 University of Utah.

IVERSON, STEVEN H. (1994) Administrative Assoc. Director, Utah Water Research Laboratory. BS 1977 Colorado State University.

JAACKS, MARILYN (1981) Assistant to Director, Center for Persons with Disabilities.

JACKMAN, ROXANNE (1994) Accountant, Controllers Office. BS 1992 Utah State University.

JACKSON, EARL K. (1991) Ext. Assoc. Prof. and Salt Lake County Agent, University Extension. BA 1963 Brigham Young University, PhD 1966 Oregon State University.

JACKSON, M. KEVEN (1989) Research Asst. Prof., Animal, Dairy, and Veterinary Sciences. DVM 1984 Louisiana State University, PhD 1990 Washington State University.

JACKSON, MICHAEL W. (1990) Visiting Prof., Political Science. BA 1968 Hastings College, MA 1971, PhD 1976 University of Alberta (Canada).

JACKSON, STEPHEN H. (1977) Ext. Assoc. Prof. and Davis County Agent (Youth), University Extension. BS 1968 University of Utah.

JACKSON, THOMAS O. (1993) Specialist, Center for Persons with Disabilities. BA 1989, MS 1991 Utah State University.

JACOBS, RICHARD W. (1976) Director, Institutional Research; Director, Budgets; Adjunct Asst. Prof., Mathematics and Statistics. BS 1964, MS 1966 Brigham Young University, PhD 1971 Arizona State University.

JACOBSON, ROSS A. (1976) Ext. Asst. Prof. and Cache County Agent, University Extension. BS 1971 Utah State University.

JAMES, D. WESLEY (1992) Systems Specialist, University Extension. BS 1991 Utah State University.

JAMES, L. DOUGLAS (1976) Prof., Civil and Environmental Engineering, Utah Water Research Laboratory. BS 1957, MS 1958, PhD 1965 Stanford University, PE.

JAMES, LYNN F. (1986) Adjunct Prof., Animal, Dairy and Veterinary Sciences. BS 1950, MS 1957, PhD 1966 Utah State University.

JAMES, VERN R. (1990) Senior Accountant, Controllers Office. BS 1958 Utah State University.

JAMES, WILLIAM R. (1993) Adjunct Asst. Prof., Civil and Environmental Engineering. BS 1969 U.S. Naval Academy, PhD 1981 Utah State University.

JANECKE, SUSANNE U. (1990) Asst. Prof., Geology. BS 1981 University of Michigan, MS 1986 University of Arizona, PhD 1991 University of Utah.

JANES, LYNN E. (1970) Assoc. Vice President, Administrative Affairs; Controller, Controllers Office. BS 1961 Utah State University, CPA 1963 State of Utah.

JAPPINEN, ILONA (1981) Assoc. Prof., Languages and Philosophy. BA 1970 Indiana University, MA 1971, PhD 1981 University of Wisconsin. Sabb. 1995-96 academic year.

JARED, ELIZABETH J. (1993) Asst. Prof., Elementary Education. BS 1986 University of Wisconsin (River Falls), MEd 1990, PhD 1993 University of Missouri.

JENKINS, MICHAEL JAMES (1982) Assoc. Prof., Forest Resources; Adjunct Assoc. Prof., Biology. BS 1976 Redlands University, MS 1978, PhD 1982 Utah State University.

JENNINGS, STEPHEN A. (1993) Assistant to Director and Insurance Coordinator, Student Health Services. DDS 1964 University of Southern California (Los Angeles).

JENSEN, ALMA M. (1988) Home Economics Agent, University Extension. BA 1968, MS 1973 California State University.

JENSEN, AZIELE S. (1995) Preschool Teacher, Center for Persons with Disabilities. BS 1971, MS 1974 Utah State University.

JENSEN, BARTELL C. (1963) President and Chief Executive Officer, Utah State University Research Foundation; Assistant to the President for USU Foundation Affairs, President's Office; Prof., Economics. BS 1959 Utah State University, PhD 1965 Purdue University.

JENSEN, CEDRA H. (1995) Counselor, Financial Aid Office. BS 1977 Utah State University.

JENSEN, DINNENE (1983) Nurse/LPN, Student Health Services. LPN 1974 Utah Technical College.

JENSEN, DONALD T. (1990) Assoc. Prof., Plants, Soils, and Biometeorology; Adjunct Assoc. Prof., Geography and Earth Resources. BA 1966 Brigham Young University, BS 1972 University of Utah, MS 1976, PhD 1978 Utah State University.

JENSEN, JANET K. (1991) Clinical Instr., Communicative Disorders and Deaf Education. BS 1972 Utah State University, MA 1973 Northwestern University.

JENSEN, JEAN C. (1989) Cataloger, Library and Information Services, Learning Resources Program. BA 1978, MLS 1987 Brigham Young University.

JENSEN, JIM C. (1981) Ext. Asst. Prof. and Utah County Agent (Youth), University Extension. BS 1976, MS 1981 Utah State University.

JENSEN, JOANNE REID (1987) Manager of Off-Campus Business Operations, Continuing Education; Adjunct Lecturer, School of Accountancy. BA 1968 University of California (Davis), BS 1987, MAcc 1993 Utah State University.

JENSEN, KEVIN B. (1994) Adjunct Asst. Prof., Plants, Soils, and Biometeorology. BS 1983, MS 1985 Utah State University, PhD 1988 Texas A&M University.

JENSEN, LARRY L. (1970) Research Project Engineer and Research Asst. Prof., Electrical and Computer Engineering and Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1963, MS 1972 Utah State University.

JENSEN, MARK D. (1988) Research Engineer, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1986, MS 1988 Utah State University.

JENSEN, PHEBE (1995) Asst. Prof., English. BA 1981 Middlebury College, MA 1986 Bread Loaf School of English, Middlebury College, PhD 1995 University of North Carolina (Chapel Hill).

JENSEN, RANDY (1983) Assoc. Director of Student Activities, Student Services. BA and BFA 1979 University of Utah, MSEd 1981 Southern Illinois University (Carbondale).

JENSEN, WILLIAM E. (1984) Supervisory Accountant, Loan and Collection Officer, Controllers Office. BS 1977 Utah State University.

JENSON, BERT H. (1992) Ext. Instr., Uintah Basin Branch Campus, Continuing Education. BA 1993 Utah State University.

JENSON, DIXIE L. (1995) Specialist, Center for Persons with Disabilities. BS 1986, MS 1990 Utah State University.

JENSON, GLEN O. (1969) Prof., Family and Human Development; Family and Human Development Specialist, University Extension. BS 1965 Utah State University, MSW 1967 University of Utah, PhD 1974 Utah State University.

JENSON, IRENE (1986) Supervisory Accountant, Controllers Office. BS 1970 Utah State University.

JENSON, KARL S. (1970) Budget Officer (Agriculture), Utah Agricultural Experiment Station and Dean's Office, College of Agriculture. BA 1969 Utah State University, MBA 1970 University of Utah.

JENSON, RICHARD L. (1987) Assoc. Prof., School of Accountancy. BA 1977 Weber State College, CPA 1979 Utah, PhD 1988 University of Utah.

JENSON, STEVEN C. (1995) Accountant, Housing Services, Auxiliary Enterprises. BS 1977 Utah State University.

JEPPESEN, M. KAY (1970) Director of Contracts and Grants, Contract and Grant Office; Adjunct Asst. Prof., School of Accountancy; Secretary, Indirect Cost Waiver Committee; Vice President, Utah State University Research Foundation. BS 1957, MBA 1971 Utah State University, CPCM 1975 National Contract Management Association.

JEPPSON, ROLAND W. (1966) Prof., Civil and Environmental Engineering and Utah Water Research Laboratory. BS 1958, MS 1960 Utah State University, PhD 1967 Stanford University.

JEWKES, RICHARD W. (1991) Senior Accountant, Controllers Office. BS 1989 Utah State University.

JOERGER, RICHARD M. (1994) Temp. Asst. Prof., Agricultural Systems Technology and Education. BS 1973 North Dakota State University, MA 1988 College of St. Thomas, PhD 1992 University of Minnesota (Minneapolis St. Paul).

JOHNS, BRUCE R. (1989) Adjunct Asst. Prof., Psychology. BA 1976 Weber State College, MS 1979 Brigham Young University, PhD 1984 Utah State University.

JOHNSON, CHARLES W. (1972) Prof., Languages and Philosophy. BA 1967 DePaul University, MA 1968, PhD 1971 Michigan State University.

JOHNSON, COLIN B. (1972) Prof. and Graduate Program Coordinator, Theatre Arts. BA 1965 San Jose State College, MFA 1967, PhD 1974 University of California (Los Angeles).

JOHNSON, CRAIG W. (1966) Prof. and Graduate Program Coordinator, Landscape Architecture and Environmental Planning. BS 1964 Michigan State University, MLA 1966 University of Illinois.

JOHNSON, DANA M. (1990) Specialist, Center for Persons with Disabilities. BS 1988 Utah State University.

JOHNSON, DAVID F. (1987) Cost Scheduling Specialist, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1964 Utah State University, MS 1971 University of Utah.

JOHNSON, DIRK E. (1994) Supervisor—Dairy Farm, Animal, Dairy and Veterinary Sciences.

JOHNSON, DOROTHY LEE (1978) Research Instr., Communicative Disorders and Deaf Education. BA 1965 University of Maryland.

JOHNSON, DOUGLAS A. (1991) Research Assistant, Forest Resources; Adjunct Prof., Rangeland Resources. BA 1971 Augustana College, MS 1973, PhD 1976 Utah State University.

JOHNSON, FRANCINE FUKUI (1983) Assoc. Prof., Elementary Education. BS 1976, MS 1979 Utah State University, PhD 1986 Stanford University.

JOHNSON, I. RICHARD (1985) Assoc. Prof., School of Accountancy. BA 1971, MBA 1972 University of Utah, MAcc 1977, PhD 1984 University of Wisconsin.

JOHNSON, JEFFREY J. (1993) Asst. Prof., Business Information Systems and Education. BS 1984 Weber State College, MBA 1989 Utah State University, PhD 1993 University of Arizona.

JOHNSON, JUDITH R. J. (1991) Asst. Librarian, Library and Information Services, Learning Resources Program.

JOHNSON, KATHLEEN O. (1987) Adjunct Prof. and Supervisor—Student Teaching/Field Experience, Elementary Education. BS 1970, MEd 1987 Utah State University.

JOHNSON, KENT NORVAL (1987) Research Technologist, Systems Division, Space Dynamics Laboratory, USU Research Foundation.

JOHNSON, MICHAEL W. (1991) Director of Utah History Fair, Mountain West Center for Regional Studies. BM 1974 Arizona State University, MS 1987 Utah State University.

JOHNSON, MILES G. (1984) Systems Programmer/Consultant, Computer Services. BS 1984 Utah State University.

JOHNSON, PAT (1992) Instr., WSU/USU Cooperative Nursing Program. BS 1983 California State University (Sacramento).

JOHNSON, SHAWNA (1983) Administrative Assistant, Center for Atmospheric and Space Sciences.

JOHNSON, THOMAS S. (1969) Dept. Head and Prof., Communicative Disorders and Deaf Education. BS 1964, MS 1967 Utah State University, PhD 1969 University of Kansas.

JOLLEY, DARWIN S. (1969) Lecturer and Specialist—Machinery, Agricultural Systems Technology and Education; Agricultural Education Specialist, University Extension. BS 1968, MS 1973 Utah State University.

JONES, ARTHUR RULON (1990) Assoc. Prof., Health, Physical Education and Recreation. BS 1968 Weber State College, MS 1970 Southern Illinois University, PhD 1978 University of Utah.

JONES, CAROLYN (1991) Bassoon Instr., Music. BS 1989 Utah State University.

JONES, CHARLES R. (1995) Lecturer, Business Information Systems and Education. BS 1969 University of Utah, MBA 1982 University of Puget Sound.

JONES, GREGORY WALTER (1976) Assoc. Dept. Head and Assoc. Prof., Computer Science. BS 1967 Massachusetts Institute of Technology, PhD 1972 University of California (Los Angeles).

JONES, KEVIN M. (1995) Coordinator of Residence Life, Housing Services, Auxiliary Enterprises. BA 1992 Oregon State University.

JONES, LARRY E. (1995) Adjunct Lecturer, Family and Human Development. BA 1977, MA 1980, JD 1981 University of Utah.

JONES, NORMAN L. (1978) Dept. Head and Prof., History; Assoc. Director, Liberal Arts and Sciences Program. BA 1972 Idaho State University, MA 1974 University of Colorado, PhD 1978 Cambridge University (England).

JONES, RANDALL M. (1990) Assoc. Prof. and Ext. Specialist (Youth Development), Family and Human Development; Adjunct Assoc. Prof., Psychology. BS 1977, MS 1982 Utah State University, PhD 1984 University of Arizona.

JONES, THOMAS A. (1987) Adjunct Asst. Prof., Rangeland Resources. BS 1979 University of Florida, MS 1981 University of Kentucky, PhD 1985 Iowa State University.

JONES, VINCENT P. (1988) Adjunct Asst. Prof., Biology. BS 1978 San Diego State University, PhD 1983 University of California.

JORGENSEN, ERIC F. (1992) Hazardous Waste Manager, Environmental Health and Safety. BS 1989 Utah State University, MS 1990 University of Utah.

JOY, SHERRY LYN (1994) Teacher, Center for Persons with Disabilities. BS 1984 Utah State University.

KACZOR, NATHAN S. (1994) Asst. Football Coach (Offensive Tackle and Tight End), Intercollegiate Athletics. BS 1991 Utah State University.

KADIS, JONATHAN (1993) Senior Producer/Director, Multimedia and Distance Learning Services; Adjunct Asst. Prof., Communication. BA 1985, MA 1986 Brigham Young University.

KADLEC, JOHN A. (1974) Asst. Dean, College of Natural Resources; Prof., Fisheries and Wildlife; Director, Watershed Science Unit. BSF 1952, MS 1956, PhD 1960 University of Michigan.

KALUARACHCHI, JAGATH J. (1991) Assoc. Prof., Utah Water Research Laboratory and Civil and Environmental Engineering. BS 1980 University of Moratuwa, MS 1984 University of Hong Kong, PhD 1988 Virginia Polytechnic University.

KANE, STANLEY G. (1992) Architectural Projects Coordinator, Campus Planning and Engineering. BS 1976, MS 1978 Queen's University (Belfast, Northern Ireland).

KARREN, JAY B. (1975) Adjunct Assoc. Prof., Biology; Entomology Specialist, University Extension. BS 1961 Brigham Young University, MS 1964, PhD 1969 University of Kansas.

KARTCHNER, ALLEN DALE (1967) Prof., Business Administration. BS 1962 University of Utah, MS 1966, PhD 1968 University of Idaho.

KASKOUN, MARY (1987) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1986 State University College (Oneonta, New York).

KAUFMAN, DARRELL S. (1993) Asst. Prof., Geology. BA/BS 1982 University of California (Santa Cruz), MS 1987 University of Washington, PhD 1991 University of Colorado (Boulder).

KAUFMANN, PHILIP R. (1986) Adjunct Assoc. Prof., Utah Water Research Laboratory. BS 1971 Gonzaga University, MS 1977 Washington State University, PhD 1987 Oregon State University.

KAWAR, AMAL (1979) Assoc. Prof., Political Science. BS 1969 Pacific College, MA 1971, PhD 1978 University of Utah.

KAY, CHARLES E. (1994) Adjunct Asst. Prof., Political Science. BS 1968, MS 1973 University of Montana, PhD 1991 Utah State University.

KEARL, JAY (1995) Asst. Prof., Aerospace Studies. BS 1995 Utah State University.

KEATON, JEFFREY R. (1984) Adjunct Prof., Civil and Environmental Engineering. BS 1971 University of Arizona, MS 1972 University of California (Los Angeles).

KEELER, RICHARD F. (1985) Adjunct Prof., Biology and Animal, Dairy and Veterinary Sciences. BS 1954 Brigham Young University, MS 1955, PhD 1957 Ohio State University.

KEITH, JOHN E. (1972) Graduate Program Coordinator and Prof., Economics. BS 1968, MS 1971, MA 1972, PhD 1973 Utah State University.

KEITH, LINDA E. (1969) University Editor, Editorial Services. BS 1967 Utah State University.

KELLER, BRADLEY W. (1993) Systems Programmer, Computer Services. BS 1981, BS 1983 Utah State University.

KELLEY, MICHAEL G. R. (1989) Ext. Asst. Prof., Uintah Basin Branch Campus, Continuing Education. BA 1966, MA 1967 Boston University, PhD 1973 University of Edinburgh.

KELLY, EMMA J. (1989) Asst. Veterinarian/Diagnostician, Animal, Dairy and Veterinary Sciences. BA 1985, DVM 1989 North Carolina State University.

KELLY-KING, JAN (1992) Clinical Instr., Communicative Disorders and Deaf Education. BS 1988 Lamar University, MS 1989 University of Southern Mississippi.

KEMBLOWSKI, EMILY (1989) Computer Programmer, Special Education and Rehabilitation. BS 1984 Kansas University.

KEMBLOWSKI, MARIAN W. (1989) Assoc. Prof., Utah Water Research Laboratory, Civil and Environmental Engineering. BS 1973 Technical University of Warsaw (Poland), PhD 1977 Institute for Land Reclamation and Grassland Farming (Warsaw, Poland).

KEMP, JOHN COOLEY (1962) Assoc. Prof., Electrical and Computer Engineering. BS 1967, MS 1969, PhD 1976 Utah State University.

KEMPLER, TOBEY (1985) Adjunct Clinical Instr., Communicative Disorders and Deaf Education. BS 1978 State University of New York (Geneseo), MS 1981 Utah State University.

KENNEDY, JAMES J. (1971) Asst. Dean for Instruction, College of Natural Resources; Prof., Forest Resources. BS 1962, MS 1966 Pennsylvania State University, PhD 1970 Virginia Polytechnic Institute.

KERR, KEVIN G. (1995) Business Manager, Bookstore, Auxiliary Enterprises. BS 1982 Brigham Young University, BS 1990, MAcc 1991 Utah State University.

KESLING, WILLARD R. (1983) Prof., Music. BA 1966 Lynchburg College, MMEd 1975, PhD 1982 University of Oklahoma.

KEYES, JAMES DALE (1985) Ext. Assoc. Prof. and San Juan County Agent (Agriculture), University Extension. BS 1982, MS 1985 Utah State University.

KEYES, SHIRLEY C. (1985) Director of Donor Relations and Records, Development Office.

KIEFER-O'DONNELL, RICHARD (1992) Adjunct Clinical Instr., Special Education and Rehabilitation. BS 1976, MEd 1981 University of Illinois.

KIGER, GARY H. (1983) Dept. Head and Prof., Sociology, Social Work and Anthropology. BA 1975 University of Colorado, MA 1978 McGill University, PhD 1983 University of Colorado.

KILLORAN, JOHN JOSEPH (1983) Program Administrator (Classrooms), Center for Persons with Disabilities; Adjunct Clinical Instr., Special Education and Rehabilitation. BS 1979, MEd 1980 Utah State University.

KIM, DAEYOON (1995) Postdoctoral Fellow, Animal, Dairy and Veterinary Sciences. BS 1979 GyogSang National University, MS 1992, PhD 1995 Utah State University.

KIM, YUN (1966) Assoc. Director, International Programs and Studies; Assoc. Dean for International Studies, College of Humanities, Arts and Social Sciences; Director, Center for International Studies; International Programs Coordinator, College of Humanities, Arts and Social Sciences; Prof. and Assoc. Director for International Education, Sociology, Social Work and Anthropology. BA 1958 Seoul National University, MA 1963 University of Pennsylvania, PhD 1967 Australian National University.

KING, JAN R. (1987) Teacher, Edith Bowen Laboratory School. BS 1974 Brigham Young University.

KING, JESS FREEMAN (1991) Assoc. Prof., Communicative Disorders and Deaf Education. BS 1967 McNeese State University (Lake Charles, Louisiana), MS 1968 Eastern New Mexico University, EdD 1978 McNeese State University.

KING, MARILYN (1984) Ext. Assoc. Prof. and Salt Lake County Ext. Agent, 4-H and Youth, University Extension. BS 1975, MS 1984 Brigham Young University.

KING, ROBERT (1990) Program Specialist and Ext. Instr., Class Division, Continuing Education. BA 1971 Dartmouth College, MA 1977 Western Washington University.

KING, VAL (1977) Research Technologist, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BA 1975 Utah State University.

KINGSFORD, A. DOUGLAS (1982) Lead Programmer/Analyst, Computer Services. BS 1980 Brigham Young University.

KINKEAD, JOYCE ANN (1982) Assoc. Dean—Academics and Ext. Program Leader, College of Humanities, Arts and Social Sciences; Prof., English; Editor, *The Writing Center Journal.* BA 1975, MA 1977 Central Missouri State University, EdD 1979 East Texas State University. Sabb. 1995-96 academic year.

KINZER, HAROLD J. (1975) Assoc. Prof., Languages and Philosophy. AB 1965 University of South Dakota, PhD 1972 Ohio State University. Sabb. 1995-96 academic year.

KIRBY, LYNN RICHARD (1979) Manager, The Junction, Food Services, Auxiliary Enterprises. BA 1969 Utah State University.

KITCHEN, BOYD M. (1992) Ext. Asst. Prof. and Uintah County Agent (Water Quality), University Extension. BS 1978 Brigham Young University, MS 1981, PhD 1982 University of Minnesota.

KJAR, ELAINE H. (1988) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1981 Brigham Young University.

KJELGREN, ROGER K. (1991) Asst. Prof., Plants, Soils, and Biometeorology. BS 1978 Washington State University, MS 1983 Oregon State University, PhD 1988 University of Washington.

KLAG, WILLIAM PRENTISS (1981) Director, Edith Bowen Laboratory School; Adjunct Instr., Elementary Education. BS 1979, MS 1984 Utah State University, EdD 1990 University of North Colorado.

KLEINKE, JOAN ANN (1983) Assoc. Vice President, Student Services; Clinical Assoc. Prof., Psychology. BA 1968 California State University (Sacramento), MEd 1975, EdD 1982 Brigham Young University.

KLINE, RICK (1987) Teacher of String Bass, Music. BM 1983 Utah State University, MM 1987 University of Nebraska.

KLINE, SHARON (1987) Teacher of Violin, Music. BM 1983 Utah State University, MM 1987 University of Nebraska.

KNAPP, JOEL D. (1989) Temp. Instr., Music. BM 1987 Wichita State University, MM 1987 University of Missouri.

KNIGHT, RICHARD S. (1968) Prof., Secondary Education. BS 1961 University of Utah, MA 1967, PhD 1972 University of Michigan.

KNOBLETT, JOYCE N. (1995) Research Associate, Biology. BS 1976 University of Maryland (College Park), MS 1986 University of California (Davis).

KOBAYASHI, N. JEAN (1982) Ext. Asst. Prof. and Salt Lake County Agent (Youth), University Extension. BA University of Utah.

KOCHAN, CAROL A. (1995) Asst. Librarian, Library and Information Services, Learning Resources Program. BA 1987, MLS 1993 University of Arizona.

KOEBBE, JOSEPH V. (1988) Assoc. Prof., Mathematics and Statistics. BA 1980 Carroll College, MS 1982 Washington State University, PhD 1988 University of Wyoming.

KOENIG, RICHARD T. (1995) Asst. Prof., Plants, Soils, and Biometeorology; Soil Science and Water Use Specialist, University Extension. BS 1988, MS 1990 University of Alaska, PhD 1993 Washington State University.

KOERNER, JANE G. (1994) Writer/Editor and *Utah State University Magazine* Editor, Information News Services. BA 1972 Colorado College.

KOETITZ, JONATHAN B. (1993) Sr. Producer/Director, Multimedia and Distance Learning Services. BA 1985, MA 1986 Brigham Young University.

KOHLER, WALLACE (1984) Supervisor of Research Farms, Utah Agricultural Experiment Station. BS 1969 Utah State University.

KOLESAR, MARY VERONICA (1984) Senior Lecturer, Computer Science. AB 1964 Emmanuel College, MS 1984 Utah State University.

KOLESAR, PETER THOMAS (1974) Assoc. Prof., Geology. BS 1966, MS 1968 Rensselaer Polytechnic Institute, PhD 1973 University of California (Riverside).

KONDO, JEFFERY K. (1984) Adjunct Assoc. Prof., Nutrition and Food Sciences, Biology. BS 1979 Oregon State University, PhD 1984 University of Minnesota.

KOTTEGODA, NATHABANDU THILAKASIRI (1979) Adjunct Prof., Utah Water Research Laboratory. BS 1952 University of London, MS 1968, PhD 1979 University of Birmingham.

KOTUBY-AMACHER, JANICE (1990) Director of Soil Testing Lab, Plants, Soils, and Biometeorology. BS 1982 Muhlenberg College, MS 1985 Pennsylvania State University, PhD 1989 Louisiana State University.

KOWSARI, MEHDI (1988) Communication Specialist, Audio Visual Services, Learning Resources Program. BS 1974, MS 1980, EdS 1984 Utah State University.

KOYBAEVA, TAIRA (1992) Asst. Prof., Languages and Philosophy. BA 1979 North Ossetian State University (USSR), PhD 1986 Leningrad State University (USSR).

KRAGTHORPE, DAVID S. (1994) Asst. Director, Alumni Relations. BS 1955, MEd 1963 Utah State University.

KRAJEWSKI, WITOLD F. (1984) Adjunct Research Assoc. Prof., Utah Water Research Laboratory; Adjunct Assoc. Prof., Civil and Environmental Engineering. MS 1976, PhD 1980 Technical University of Warsaw (Poland), Environmental Engineering Institute.

KRANNICH, MARILYN KAY (1990) Art Slide Librarian, Art. BA 1974 Kent State University, BFA 1983, MFA 1986 Utah State University.

KRANNICH, RICHARD S. (1980) Asst. Dept. Head and Prof., Sociology, Social Work and Anthropology; Prof., Forest Resources; Leader, Institute for Social Science Research on Natural Resources. BA 1974 Kent State University, MS 1977 Utah State University, PhD 1980 Pennsylvania State University.

KRAS, JOHN M. (1995) Asst. Prof., Health, Physical Education and Recreation. BS 1976, MA 1977 Austin College, EdD 1994 East Texas State University.

KRISTL, JOSEPH (1986) Research Engineer, Stewart Radiance Laboratory, Space Dynamics Laboratory, USU Research Foundation. BS 1982 Massachusetts Institute of Technology.

KROGH, KEVIN L. (1989) Lecturer, Languages and Philosophy. BA 1976 Utah State University, MA 1980 University of Texas (Austin), BLA 1986 Utah State University.

KROMBERG, SCOTT LLOYD (1985) Research Associate, Rangeland Resources. BS 1977 Arizona State University, MS 1983 Montana State University.

KROPP, BRADLEY R. (1991) Asst. Prof., Biology. BS 1975 Utah State University, PhD 1981 Oregon State University.

KRUSE, MARILYN BIRCH (1986) Facilitator, College of Family Life. BS 1965 University of Wyoming, MS 1985 Utah State University.

KRUTSCH, LOUIS K. (1994) Manager, Ticket Office; Asst. Athletic Director—Ticketing, Intercollegiate Athletics. BS 1982, MA 1986 Brigham Young University.

KUHNS, MICHAEL RICHARD (1992) Assoc. Prof., Forest Resources. BS 1977, MS 1980 University of Missouri (Columbia), PhD 1986 Auburn University.

KURTZMAN, JUDITH A. (1995) Field Interviewer Supervisor, Cache County Memory Study, College of Family Life. BA 1981 University of Minnesota (Duluth).

LaBONTY, DENNIS (1990) Assoc. Prof., Business Information Systems and Education. BA 1971, MA 1981 University of Montana, PhD 1987 University of Nebraska (Lincoln).

LACHMAR, THOMAS E. (1990) Asst. Prof., Geology. BS 1975 University of California (Davis), MS 1977 Purdue University, PhD 1989 University of Idaho.

LACKSTROM, JOHN EDWIN (1970) Prof., Languages and Philosophy. BA 1965, MA 1967, PhD 1970 University of Washington.

LACY, MARK J. (1994) Research Associate, Instructional Technology. BA 1985 California State University (Sacramento), MS 1994 Utah State University.

LAFFERTY, VINCENT J. (1976) Director and Ext. Asst. Prof., Tooele Branch Campus, University Extension. BA 1970 Northeastern State College, MA 1976 University of Tulsa.

LAFOND, JEAN-RONALD (1995) Temp. Asst. Prof., Music. BM 1988 Westminster Chior College (Princeton, New Jersey), MM 1990, DMA 1995 University of Michigan (Ann Arbor).

L'AI, LINDA (1988) Teacher, Edith Bowen Laboratory School. BS 1969 University of California (Davis), MA 1984 California State University (Sacramento).

LAI, WUYAN (1995) Adjunct Prof., Physics. BS 1963 Peking University.

LALL, UPMANU (1988) Prof., Civil and Environmental Engineering and Utah Water Research Laboratory. B. Tech 1977 IIT (Kanpur, India), MS 1980, PhD 1981 University of Texas (Austin).

LAMARRA, VINCENT A. (1975) Adjunct Research Asst. Prof., Utah Water Research Laboratory. BA 1969 Fresno Pacific College, PhD 1975 University of Minnesota.

LAMB, ROBERT C. (1961) Dept. Head and Prof., Animal, Dairy and Veterinary Sciences. BS 1956 Utah State University, MS 1959, PhD 1962 Michigan State University.

LANCY, DAVID F. (1992) Prof., Sociology, Social Work and Anthropology. BS 1967 Yale University, PhD 1975 University of Pittsburgh. Sabb. 1995-96 academic year.

LANNER, RONALD M. (1967) Prof., Forest Resources. BS 1952, MF 1958 Syracuse University, PhD 1968 University of Minnesota.

LaROCCO, CRAIG B. (1990) Program Administrator, Office of International Students and Scholars, Student Services. BS 1988 Utah State University.

LARSEN, CHARLES B. (1985) Lecturer, Industrial Technology and Education. BS 1962, ME 1977 Utah State University.

LARSEN, CINDY (1986) Asst. Director, Financial Aid Office.

LARSEN, MARIANNA (1990) Lecturer, Business Information Systems and Education. BS 1974, MEd 1983 Utah State University.

LARSEN, MARK D. (1987) Assoc. Prof., Languages and Philosophy, and Class Division, Continuing Education. BA 1975, MA 1977 University of Utah, MPhil 1979, PhD 1980 Yale University.

LARSEN, MELVIN H. (1976) Director, University Academic Service Center; Assoc. Director, Division of Academic Support Services; Adjunct Instr., Psychology. BS 1966, MEd 1968 Utah State University, MS 1980 University of Utah.

LARSON, DON C. (1991) Director of Continuing Education in Southwestern Utah and Ext. Asst. Prof., Class Division, Continuing Education; Adjunct Asst. Prof., Sociology, Social Work and Anthropology. BS 1977 Brigham Young University, MS 1984, PhD 1988 Utah State University.

LARSON, GALE HARDING (1992) Adjunct Assoc. Prof., Civil and Environmental Engineering. BS 1963, MS 1965 Utah State University.

LARSON, VICKIE (1993) Manager of Off-campus Student Services, Class Division, Continuing Education. BS 1986 Utah State University.

LAUGHLIN, KATHLEEN CAROLINE (1984) Clinical Instr., Communicative Disorders and Deaf Education. BS 1978 Oregon State University, MS 1981 Utah State University.

LAURITZEN, GEORGIA C. (1976) Nutrition Specialist, University Extension; Ext. Assoc. Prof., Nutrition and Food Sciences. BS 1958, MS 1963, PhD 1982 Utah State University.

LAVOIE, CAROLINE (1995) Asst. Prof., Landscape Architecture and Environmental Planning. BA 1989 Universite de Montreal, MS 1995, MLA 1995 University of Southern California (Los Angeles).

LAW, CRAIG (1977) Prof., Art. BA 1973, MFA 1978 Utah State University.

LAWSON, LANCE (1995) Research Engineer, Electrical and Computer Engineering. BS 1990 Utah State University.

LEAVITT, MARY E. (1979) Director, Science and HASS Advising Center. BA 1976 Indiana University, MA 1979 Utah State University.

LeCHEMINANT, JUDY (1983) Director, Financial Aid Office. BS 1969 University of Utah.

LEE, CARLA D. (1994) Ext. Instr. and 4-H Activities Coordinator, Youth Programs, University Extension. BS 1988 North Dakota State University (Fargo).

LEE, THOMAS R. (1982) Prof., Family and Human Development; Family and Human Development Specialist, University Extension. BA 1977 University of Utah, MS 1979 Utah State University, PhD 1982 Virginia Polytechnic Institute and State University.

LEFFLER, ANN (1980) Acting Assoc. Dean, College of Humanities, Arts and Social Sciences; Prof., Sociology, Social Work and Anthropology; Director, Liberal Arts and Sciences Program, College of Humanities, Arts and Social Sciences. BS 1967 Brandeis University, MA 1970, PhD 1979 University of California (Berkeley).

LEISHMAN, LISA C. (1995) Asst. Director, Parking and Transportation Services. BA 1993 Utah State University.

LEISHMAN, RUTH N. (1994) Adjunct Clinical Instr., Special Education and Rehabilitation. BS 1987, MEd 1989 Utah State University.

LEONARD, DERRI DEE (1995) Administrative Assistant, Class Division, Continuing Education.

LEONE, NICHOLAS CHARLES (1985) Adjunct Prof., Animal, Dairy and Veterinary Sciences. BS 1929, PhD 1936 University of California (Berkeley), CPH 1941 Harvard University, MD 1950 Duke University.

LEONHARDT, CHUCK (1995) Marketing Manager, Auxiliary Enterprises. BS 1988 Utah State University.

LESPERANCE, ROBBYN G. (1995) Specialist, Center for Persons with Disabilities. BS 1995 Utah State University.

LEVINE, AUDREY D. (1994) Assoc. Prof., Civil and Environmental Engineering. BA 1975 Bates College. MS 1980 Tulane University School of Public Health, PhD 1985 University of California (Davis).

LEWANDOWSKI, JOHN G. (1993) Asst. Athletic Director—Media Relations, University Relations and Development. BBA 1984 University of Notre Dame.

LEWIS, DAVID R. (1988) Assoc. Prof., History; Assoc. Editor, *Western Historical Quarterly*. BS 1979 Utah State University, MA 1980 University of Toronto, MA 1983, PhD 1988 University of Wisconsin.

LEWIS, JAYLYNN (1993) Assoc. Manager, Engineering Experiment Station, College of Engineering. BS 1984 Utah State University.

LEWIS, MICHAEL RICHARD (1983) Asst. Director, Contract and Grant Office. BA 1964 Brigham Young University.

LEWIS, W. CRIS (1972) Prof., Economics. BS 1962 Brigham Young University, MBA 1964 Northwestern University, PhD 1969 Iowa State University.

LI, JOSEPH K. K. (1983) Prof., Biology. BS 1967 University of Redlands, MS 1970 State University of California, PhD 1975 University of California.

LI, ZHONGMIN (1988) Research Asst. Prof., Instructional Technology. MS 1985, PhD 1988 University of Southern California.

LIDDELL, WILLIAM DAVID (1981) Prof., Geology; Adjunct Prof., Biology. BA 1973 Miami University, MS 1975, PhD 1980 University of Michigan.

LIGNUGARIS/KRAFT, BENJAMIN (1988) Assoc. Prof., Special Education and Rehabilitation. BA 1972 University of Vermont, BA 1973 Vermont Community College, MEd 1981 University of Oregon, PhD 1987 Utah State University.

LIKINS, MARILYN (1988) Specialist, Center for Persons with Disabilities. BS 1977 University of Utah, MS 1988 Utah State University.

LILIEHOLM, ROBERT J. (1988) Assoc. Prof., Forest Resources. BS 1982 Utah State University, MS 1984 Louisiana State University, PhD 1988 University of California (Berkeley).

LIND, VANCE GORDON (1964) Prof., Physics. BS 1959 Utah State University, MS 1961, PhD 1964 University of Wisconsin. Sabb. 7-1-95 to 6-30-96.

LINDAHL, ALICE MARIE (1992) Lecturer, Biology. BA 1967 Whitman College (Walla Walla, WA), MS 1971 Oregon State University (Corvallis).

LINDAUER, SHELLEY L. KNUDSEN (1982) Assoc. Prof., Family and Human Development; Director, Child Development Laboratory. BS 1975 Colorado State University, MS 1980, PhD 1982 Oregon State University.

LINFORD, LYNDA (1978) Assoc. Prof., Theatre Arts. AB 1969 Utah State University, MFA 1971 University of Minnesota. Sabb. 1995-96 academic year.

LITTLE, RONALD L. (1975) Prof., Sociology, Social Work and Anthropology. BS 1963 University of Utah, PhD 1971 University of Oregon.

LITTLEDIKE, LAURIE (1988) Specialist—Documentation Coordinator, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1968, MS 1985 Utah State University.

LITTLEDIKE, LILA JACLYN (1969) Asst. Prof., Communicative Disorders and Deaf Education. BS 1965, MS 1967 Utah State University.

LITTLEJOHN, LANCE L. (1983) Prof., Mathematics and Statistics. BS 1975, MA 1976 University of Western Ontario, PhD 1981 Pennsylvania State University.

LOHR, JOHN T. (1988) Manager, Biotechnology Center, Utah Agricultural Experiment Station; Adjunct Asst. Prof., Animal, Dairy and Veterinary Sciences; Adjunct Asst. Prof., Nutrition and Food Sciences. BS 1973, MS 1975 Fairleigh Dickinson University, PhD 1983 University of Maryland.

LONDON, ROSANNE (1986) Temp. Instr., Political Science. BS 1971 Weber State College, MSS 1988 Utah State University.

LONG, ALEXIS B. (1988) Adjunct Prof., Plants, Soils, and Biometeorology. BS 1965 Reed College, MS 1966 Syracuse University, PhD 1972 University of Arizona.

LONG, ILONE DONNA (1971) Lecturer, Edith Bowen Laboratory School. BA 1957, ME 1963 Washington State University.

LONG, JAMES N. (1980) Prof., Forest Resources. BS 1968, MS 1973, PhD 1976 University of Washington.

LONGE, JENNIFER (1995) Media Relations Assistant, Intercollegiate Athletics. BA 1993 State University of New York (Oswego).

LOPEZ, CHUCK (1993) Director of New Student Orientation, Academic Support Services. BBA 1987, MEd 1992 Stephen F. Austin State University (Nacogdoches, TX).

LOVELAND, L. DUANE (1965) Prof., Mathematics and Statistics. BS 1958, MS 1962, PhD 1965 University of Utah.

LOW, EUGENE J. (1983) Adjunct Clinical Prof., Biology. BS 1964 Utah State University, MD 1968 University of Utah.

LOW, REBECCA (1986) Ext. Instr. and Salt Lake County Agent (Home Economics), University Extension. BS 1977 Utah State University. Sabb. beginning 10-1-94.

LOWE, ANITA L. (1991) Asst. Director, MBA Program, College of Business. BS 1989, MS 1991 Utah State University.

LOWN, JEAN M. (1982) Asst. Dept. Head and Prof., Human Environments. BS 1972 State University of New York (Oneonta), MS 1974 Cornell University, PhD 1979 Virginia Polytechnic Institute and State University.

LOWRY, WILLIAM H. (1992) Specialist, Center for Persons with Disabilities. BS 1967 Washington and Lee University, MEd 1981, PhD 1989 Utah State University.

LUBKE, MARGARET M. (1987) Research Associate, Center for Persons with Disabilities; Research Asst. Prof., Special Education and Rehabilitation. BSE 1972, MSE 1981 University of Wisconsin, PhD 1987 Utah State University.

LUECKE, CHRIS (1988) Assoc. Prof., Fisheries and Wildlife. BA 1978, MS 1981 University of Kansas, PhD 1986 University of Washington.

LUND, HAROLD M.H., II (1984) Supervisory Accountant, Controllers Office. BA 1971, MEd 1972 University of Utah, MAcc 1978 Utah State University.

LUNDGREN, ADRIAN B. (1990) Operations Supervisor, Computer Services. BA 1994 Utah State University.

LUNDGREEN, ALLEN G. (1995) Facilities Coordinator, Taggart Student Center, Student Services.

LUTHY, DAVID H. (1975) Senior Assoc. Dean and Ext. Program Leader, College of Business; Richard C. and Vera C. Stratford Prof., School of Accountancy. BS 1964, MBA 1970 Utah State University, DBA 1975 Indiana University, CPA 1977 State of Indiana, CPA 1978 State of Utah. Sabb. 7-1-95 to 6-30-96.

LUTZ, CHARLES MICHAEL (1980) Assoc. Prof. and Graduate Program Director, Business Information Systems and Education. BS 1959 U.S. Military Academy, MBA 1975 University of Utah, EdD 1984 Utah State University.

LUX, DONALD C. (1994) Adjunct Prof., Industrial Technology and Education. BS 1947, MS 1952 University of Wisconsin, PhD 1955 Ohio State University.

LYMAN, EDWARD L. CPT (1995) Asst. Prof., Military Science. BS 1987 Portland State University.

LYNCH, HAROLD LEROY (1971) Systems Programmer, Computer Services. AS 1961 Los Angeles Trade Tech., BS 1971 Utah State University.

LYNCH, MARJORIE (1993) Specialist, Center for Persons with Disabilities. BA 1991 Utah State Unversity.

LYNN, RAYMOND IRVIN (1968) Assoc. Prof., Biology. BA 1963 University of Oklahoma, PhD 1968 Indiana University.

LYNN, VIVA LEE (1970) Principal Lecturer, Asst. Language Laboratory Director, Languages and Philosophy. BA 1962 University of Oklahoma, MA 1970 Indiana University.

LYON, KENNETH S. (1966) Prof., Economics. BS 1960 Brigham Young University, AM 1965, PhD 1970 University of Chicago.

LYON, THOMAS J. (1964) Prof., English; Editor, *Western American Literature*. BS 1959, MS 1961 Utah State University.

LYONS, JANET P. (1993) Asst. Director, Career Services and Cooperative Education. BA 1974 University of California (Santa Barbara), MBA 1980 Utah State University.

LYONS, MICHAEL S. (1978) Asst. Prof., Political Science. BA 1969, MA 1971, PhD 1979 University of California (Santa Barbara).

MA, TI-ZE (1987) Research Assoc. Prof., Physics. BS 1981 Nanjing University (China), MS 1983, PhD 1986 University of Iowa.

MacADAM, JENNIFER W. (1991) Asst. Prof., Plants, Soils, and Biometeorology. BS 1982 Southwest Missouri State University, MS 1984, PhD 1988 University of Missouri.

MacCOMBER, CURTIS JAMES (1987) Adjunct Assoc. Prof., Music. BM 1979, MM 1982, DMA Juilliard School of Music.

MACIULIS, ALMA ANNE (1988) Research Associate, Animal, Dairy and Veterinary Sciences. BS 1980 Southern Utah State College, MS 1984 Utah State University.

MacMAHON, JAMES A. (1971) Dean, College of Science; Prof., Biology. BS 1960 Michigan State University, PhD 1963 Notre Dame University.

MADSEN, F. DEAN (1971) Prof., Music. BM 1960, MM 1961 University of Oregon, EdD 1970 Utah State University.

MADSEN, GARY E. (1971) Assoc. Prof., Sociology, Social Work and Anthropology. BS 1963, MS 1968, PhD 1972 University of Utah. Sabb. 1995-96 academic year.

MALACHOWSKI, DEBBIE (1994) Asst. Coach, Women's Track, Intercollegiate Athletics. BS 1994 Azusa Pacific University.

MALECHEK, JOHN C. (1970) Dept. Head and Prof., Rangeland Resources; Interim Director, Institute for Land Rehabilitation. BS 1964 Texas Technological College, MS 1966 Colorado State University, PhD 1970 Texas A&M University.

MALEK, ESMAIEL (1989) Research Assoc. Prof., Plants, Soils, and Biometeorology. BS and MS 1968 Tabriz University (Iran), MS 1974 Shiraz University (Iran), PhD 1977 Utah State University.

MALHEREK, PATRICK J. MAJ (1995) Dept. Head and Prof., Military Science. BS 1979 University of Notre Dame, MA 1990 The Ohio State University.

MALKO, J. ROBERT (1987) Prof., Business Administration. BS 1966 Loyola College, MS 1968, PhD 1972 Purdue University.

MALMGREN, MONICA R. (1995) Speech Pathologist, Center for Persons with Disabilities. BS 1993, MS 1995 Utah State University.

MANUEL-DUPONT, SONIA S. (1983) Assoc. Prof., English, Communicative Disorders and Deaf Education. BA 1977, MA 1979, M. Phil 1981, PhD 1985 University of Kansas.

MANWARING, JOHN (1990) Research Associate, Rangeland Resources. BS 1977 Utah State University.

MARK, GREGORY S. (1995) Asst. Football Coach, Intercollegiate Athletics. BS 1989, MS 1995 University of Miami.

MARKESON, ALTA (1990) Job Locator, Career Services and Cooperative Education; Partners Program Editor, College of Business. BS 1990 Utah State University.

MARKS, DANNY (1994) Adjunct Asst. Prof., Civil and Environmental Engineering. BA 1976, MA 1978, PhD 1988 University of California (Santa Barbara).

MARSHALL, JILL ANN (1994) Asst. Prof., Physics. BS 1980 Stanford University, PhD 1984 University of Texas (Austin).

MARSHALL, KIM ARTHUR (1972) Manager of Technical Services, Computer Services. BS 1972 Utah State University.

MARSHALL, MICHAEL R. (1986) Adjunct Research Prof., Animal, Dairy and Veterinary Sciences. BS 1972 Utah State University, DVM 1975 Colorado State University.

MARTIN, CAROLYN THOMAS (1993) Specialist, Center for Persons with Disabilities. BA 1978 Ft. Lewis College (Colorado), MS 1986 Utah State University.

MARTINEZ, CYNTHIA D. (1988) Adjunct Lecturer, Biology. BS 1974 Utah State University.

MARTINEZ, IZAR A. (1973) Dean, College of Education; Prof., Secondary Education. BS 1961, MA 1965 University of New Mexico, EdD 1973 Utah State University.

MASACCHIO, LAURA (1993) Asst. Prof., Landscape Architecture and Environmental Planning. BLA 1989, MLA 1993 State University of New York (Syracuse).

MASON, DEREK T. (1989) Assoc. Prof., Sociology, Social Work and Anthropology. BA 1975 University of Rochester, MA 1978 Bowling Green State University, MSW 1984, PhD 1989 University of Iowa.

MASTERS, KEVIN (1995) Asst. Prof., Psychology. BA 1980 Cedarville College, MA 1982 University of Dayton, PhD 1989 Brigham Young University.

MATHESIUS, PETER J. (1988) Lecturer, Health, Physical Education and Recreation. BA 1978 San Francisco State University, MS 1981 Utah State University.

MATHIS, BARBARA B. (1985) Ext. Instr. and Duchesne County Agent (Home Economics), University Extension. BS 1966 Utah State University.

MATHIS-ROSS, JO ANN (1972) Ext. Assoc. Prof. and Davis County Agent (Home Economics), University Extension. BS 1968 Utah State University, MS 1972 Colorado State University.

MATTHEWS, MARDYNE (1981) Supervisor of Employment, Personnel Services.

MATTHEWS, NYLE J. (1966) Assoc. Prof., Animal, Dairy and Veterinary Sciences; Central Utah Area Livestock Specialist and Sevier County Agent, University Extension. BS 1958, MS 1960 Utah State University.

MAUK, GARY W. (1989) Specialist, Center for Persons with Disabilities, BA 1982 California State Polytechnic University (Pomona), MA 1983 Gallaudet University.

MAW, GLEN HAROLD (1969) Director and Adjunct Assoc. Prof., Personal Development Center, Student Services; Adjunct Assoc. Prof., Psychology. BS 1964 University of Utah, EdM 1966, PhD 1974 University of Illinois (Urbana-Champaign).

MAYS, JOHN (1992) Programmer/Analyst, Computer Services. BS 1984 Weber State College.

McALLISTER, TIMOTHY A. (1995) Adjunct Research Asst. Prof., Animal, Dairy and Veterinary Sciences. BSc 1985, MSc 1987 University of Alberta (Edmonton, Canada), PhD 1991 University of Guelph (Ontario, Canada).

McARTHUR, J'WAYNE (1969) Lecturer, Animal, Dairy and Veterinary Sciences. BS 1961, MS 1963 Utah State University.

McCALPIN, JAMES PATRICK (1982) Research Assoc. Prof., Geology. BA 1972 University of Texas (Austin), MS 1975 University of Colorado, PhD 1981 Colorado School of Mines.

McCARREY, LEON R. (1982) Prof., Management and Human Resources. BS 1955 Utah State University, MS 1958 Brigham Young University, PhD 1963 University of Oregon.

McCARTNEY, TIM R. (1993) Executive Chef, Carousel Square, Food Services, Auxiliary Enterprises.

McCARTY, DARYL J. (1990) Specialist, Center for Persons with Disabilities. BS 1952, MS 1960, EdD 1967 University of Utah.

McCLURE, CAMI B. (1994) Administrator of Credit Programs/Travel Study, Conference and Institute Division, Continuing Education. BS 1990 University of Arizona.

McCONKIE, KATHERINE (1993) Asst. to Director, International Programs and Studies. BA 1993 Utah State University.

McCONNELL, LEE ANNE (1989) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1985 Brigham Young University.

McCULLOUGH, EDWARD A., Jr. (1972) Prof., Chemistry and Biochemistry. BS 1966 Stanford University, PhD 1971 University of Texas.

McCULLOUGH, JANE L. (1967) Assoc. Prof., Human Environments. BS 1962, MS 1969 Utah State University, PhD 1980 Michigan State University.

McCUSKEY, BRIAN W. (1995) Asst. Prof., English. BA 1989 University of North Carolina (Chapel Hill), MA 1991, PhD 1995 University of Michigan.

McDERMOTT, JOHN C. (1987) Adjunct Assoc. Prof., Communicative Disorders and Deaf Education. BA 1973 University of Akron, MA 1975 Kent State University, PhD 1980 University of Arizona.

McDONALD, KATIE (1981) Adjunct Clinical Instr., Nutrition and Food Sciences. BS 1975 University of Utah, MS 1980 Utah State University.

McDONNELL, JEFFREY JOHN (1989) Adjunct Asst. Prof., Forest Resources; Adjunct Asst. Prof., Geography and Earth Resources. BS 1983 University of Toronto (Canada), MS 1985 Trent University (Canada), PhD 1989 University of Canterbury (New Zealand).

McENTIRE, ROBERT H. (1975) Adjunct Prof., Mechanical and Aerospace Engineering. BS 1967 University of Utah, MS 1969, ME 1970, PhD 1971 Massachusetts Institute of Technology.

McEVOY, GLENN M. (1985) Prof., Management and Human Resources; Director, Management Institute, Continuing Education. BS 1970 University of California (Berkeley), MS 1974, PhD 1985 University of Colorado.

McEVOY, ROGER (1975) Supervisor, TV Production, Multimedia and Distance Learning Services; Adjunct Asst. Prof., Communication; Radio-TV Specialist, University Extension. BS 1967 Brigham Young University.

McFADDEN, JOAN R. (1978) Dept. Head and Prof., Human Environments. BS 1956, MS 1957 Purdue Uniyersity, PhD 1972 Ohio State University.

McFARLAND, MICHAEL J. (1988) Assoc. Prof., Utah Water Research Laboratory, Civil and Environmental Engineering. BS 1980 Yale University, MS 1983, PhD 1987 Cornell University. Sabb. 10-1-95 to 6-30-96.

McGREW, JERRY PATRICK (1980) Supervisory Accountant, Controllers Office. BS 1966 California Baptist College.

McGREW, MARLYS JANE (1995) Area Coordinator, Family Student Housing, Housing Services, Auxiliary Enterprises.

McINERNEY, DANIEL J. (1986) Director, Honors Program; Assoc. Prof., History. BA 1972 Manhattan College, MA 1974, PhD 1984 Purdue University.

McINERNEY, IRENE B. (1991) Adviser, Science/HASS Advising Center. BA 1980, MS 1981 Purdue University.

McIVOR, DONALD E. (1995) Research Associate, Fisheries and Wildlife. BA 1986 University of Virginia, MS 1993 Utah State University.

McKEAN, GARY O. (1991) Adjunct Asst. Prof., History. BA 1963 Tulane University, JD 1966 University of Florida Law School, MS 1990 Utah State University.

McKEE, MAC (1985) Adjunct Research Assoc. Prof., Utah Water Research Laboratory. BS 1972, MS 1981, PhD 1986 Utah State University.

McKEEHAN, ANN B. (1983) Clinical Instr., Communicative Disorders and Deaf Education. BS 1969 Utah State University, MS 1970 University of Utah. LWOP 7-1-95 to 6-30-96.

McKENDRICK, SCOTT S. (1975) Ext. Instr. and Ext. Specialist, Dept. Head (Logan), University Extension. BS 1973, MS 1976 Utah State University.

McKENNA, REED E. (1983) Research Engineer, Stewart Radiance Laboratory, Space Dynamics Laboratory, USU Research Foundation. BS 1983 Utah State University.

McKNIGHT, TERESA W. (1994) Administrative Assistant, Instructional Technology.

McLAUGHLIN, JOHN E. (1994) Asst. Prof., English. BA 1975 Utah State University, MA 1978 University of Utah, PhD 1987 University of Kansas.

McLAUGHLIN, JOHN FRANCIS (1994) Adjunct Asst. Prof., Forest Resources. BA 1984 Northwestern University, MS 1987, PhD 1990 Stanford University.

McLAUGHLIN, SANDRA JEAN (1985) Program Administrator, Center for Persons with Disabilities.

McLEAN, JOAN E. (1983) Research Asst. Prof., Utah Water Research Laboratory and Civil and Environmental Engineering. BS 1975 University of San Francisco, MS 1978 University of California (Davis).

McMAHON, DONALD J. (1987) Assoc. Prof., Nutrition and Food Sciences; Food/Nutrition Specialist, University Extension. BAS 1978 Institute of Technology (Australia), PhD 1983 Utah State University.

McMASTER, STEVEN T. (1992) Director, Purchasing Services. BS 1985, JD 1988 University of Utah.

McMURRAY, MARTHA P. (1985) Adjunct Instr., Nutrition and Food Sciences. BA 1968, BS 1973 University of Iowa.

McNAMARA, CAROL LYNN (1992) Visiting Instr., Political Science; Adjunct Instr., History. BA 1985 University of Toronto (Canada).

McNAMARA, PETER (1991) Asst. Prof., Political Science. BS 1980 University of Queensland (Brisbane, Australia), PhD 1990 Boston College.

McNEAL, LYLE GLEN (1979) Prof., Animal, Dairy and Veterinary Sciences. BS 1964 California Polytechnic Institute, MS 1966 University of Nevada, PhD 1978 Utah State University.

MECHAM, CONNIE M. (1995) Temp. Lecturer, Intensive English Language Institute. BA 1967 Utah State University, MA 1969 University of Illinois (Champaign-Urbana).

MECHAM, STEVEN J. (1992) Director, University Police. BA 1986 Brigham Young University, MSS 1990 Utah State University.

MEDLYN, DAVID A. (1982) Assoc. Dean of Continuing Education for Off-campus Centers and Degree Programs, Continuing Education; Director, Class Division; Assoc. Prof., University Extension. BS 1970, MS 1972, PhD 1976 Brigham Young University.

MEEKS, LYNN LANGER (1994) Asst. Prof., English. BA 1968 College of Idaho (Caldwell), MA 1977, PhD 1985 Arizona State University.

MEMMOTT, MARGIE P. (1993) Ext. Asst. Prof. and Juab County Agent, University Extension. BS 1979 Brigham Young University, MS 1981 Utah State University.

MENDENHALL, J'LENE (1987) Teacher of Voice, Music. BS 1974 Southern Utah State College, MM 1977 University of Utah.

MENDENHALL, VON THATCHER (1972) Prof., Nutrition and Food Sciences; Food Science Specialist, University Extension. BS 1961, MS 1967 Utah State University, PhD 1970 Oregon State University.

MENG, RICHARD S. (1974) General Manager, KUSU-FM (Utah Public Radio). BS 1969 Utah State University.

MENLOVE, MARTELL (1990) Specialist, Center for Persons with Disabilities. BA 1976 Utah State University, MEd 1979 University of Utah.

MENTZEL, PETER (1995) Asst. Prof., History. BA 1985 University of Connecticut, MA 1988, PhD 1994 University of Washington.

MERIWETHER, JOHN W., Jr. (1992) Adjunct Prof., Physics. BS 1964 Massachusetts Institute of Technology, PhD 1970 University of Maryland.

MERKLEY, GARY P. (1985) Asst. Prof., Biological and Irrigation Engineering. BS 1981 California Polytechnic State University, MS 1982 Utah State University.

MERRELL, KENNETH W. (1991) Assoc. Prof., Psychology. BS 1982 Oregon State University, MS 1984 University of Oregon, EdS 1985 University of Idaho, PhD 1988 University of Oregon.

MERRIAM, JONATHAN W. (1993) Temp. Instr., Animal, Dairy and Veterinary Sciences. BS 1989 California Polytechnic State University, MS 1993 University of Wisconsin (Madison).

MERRILL, CHLOE (1994) Adjunct Instr., Human Environments. BS 1977, MS 1979 Utah State University, PhD 1984 Colorado State University.

MERRILL, M. DAVID (1987) Prof., Instructional Technology. BA 1961 Brigham Young University, MA 1964, PhD 1964 University of Illinois.

MERRILL, REED M. (1972) Clinical Instr., Communicative Disorders and Deaf Education. BS 1952 Utah State University, DDS 1956 University of Washington, MS 1963 University of Southern California.

MERRILL, ZAN (1991) Specialist—Instructional Design, Special Education and Rehabilitation. BFA 1976, MEd 1986 Utah State University.

MERWE, JOE VANDE (1994) Asst. Director, Budget Office. BS 1984 University of Utah, MBA 1987 Westminster College.

MESSINA, FRANK J. (1986) Assoc. Prof., Biology. BA 1976 Clark University, PhD 1982 Cornell University.

MESSMER, TERRY A. (1991) Asst. Prof., Fisheries and Wildlife; Wildlife Resources Specialist, University Extension. BS 1977, BSEd 1979 University of North Dakota, MS 1985, MS 1986, PhD 1990 North Dakota State University.

MICHEL, FAWN (1990) Asst. Athletic Trainer, Intercollegiate Athletics. BS 1988 Ithaca College, MS 1990 University of Arizona.

MIDZINSKI, JACQUELINE SORENSEN (1974) Special Education Materials Specialist, Center for Persons with Disabilities. BA 1971, MEd 1973 Utah State University.

MILDENBERGER, DALE P. (1975) Asst. Athletic Director for Support Services and Head Trainer, Intercollegiate Athletics; Adjunct Asst. Prof., Health, Physical Education and Recreation. BS 1973 Colorado State University, MS 1975 University of Arizona.

MILES, SCOTT D. (1987) Research Engineer, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1980 Brigham Young University.

MILESKI, GERALD J. (1987) Supervisor—Laboratory, Utah Agricultural Experiment Station. BS 1977 Michigan State University.

MILLBURN, GARY K. (1977) Manager, Vending and Concessions, Food Services, Auxiliary Enterprises.

MILLER, BRENT C. (1979) Dept. Head and Prof., Family and Human Development; Adjunct Prof., Human Environments; Chairman, Committee on Human Subjects. BS 1971 Weber State College, MS 1972 Utah State University, PhD 1975 University of Minnesota.

MILLER, BRUCE E. (1991) Asst. Dept. Head and Asst. Prof., Agricultural Systems Technology and Education. BS 1984, MS 1986 University of Nebraska (Lincoln), PhD 1991 Iowa State University.

MILLER, CAREY M. (1995) Specialist, Center for Persons with Disabilities. BS 1978 Utah State University.

MILLER, CHARLES D. (1994) Postdoctoral Fellow, Biology. BS 1988 University of Wisconsin (Madison), PhD 1994 North Carolina State University.

MILLER, DAVID (1994) Asst. Coach - Men's Basketball, Intercollegiate Athletics. BS 1985 Springfield College, MS 1986 Eastern Kentucky University.

MILLER, JEFFREY P. (1995) Teaching Asst. Prof., Nutrition and Food Sciences. BGS 1983 University of Kansas, AOS 1986 New England Culinary Institute. MS 1995 Kansas State University.

MILLER, KENT L. (1984) Research Prof., Physics. BS 1971 Utah State University, MS 1973, PhD 1977 University of Illinois.

MILLIGAN, WHITNEY (1989) Hall Director, Housing Services, Auxiliary Enterprises. BA 1989 Utah State University.

MILNE, MELANIE (1995) Assoc. Director, Parking and Transportation Services.

MILNER, CLYDE A., II (1976) Prof., History; Editor, *Western Historical Quarterly*. BA 1971 University of North Carolina, MA 1973, M Phil 1974, PhD 1979 Yale University.

MILOVICH, TODD (1994) Counselor, Financial Aid Office. BA 1984 Utah State University.

MILTNER, ERIC D. (1994) Asst. Prof., Plants, Soils, and Biometeorology. BSA 1985, MS 1988 University of Georgia, PhD 1994 Michigan State University.

MINER, FARRELL DEAN (1986) Ext. Assoc. Prof. and Utah County Agent (Agriculture), University Extension. BS 1974 Brigham Young University.

MINNOTTE, MICHAEL C. (1992) Asst. Prof., Mathematics and Statistics. BA 1989, PhD 1992 Rice University.

MIR, ZAHIR (1995) Adjunct Research Assoc. Prof., Animal, Dairy and Veterinary Sciences. BSc 1974 University of Waterloo (Ontario, Canada), MSc 1978, PhD 1983 University of Guelph (Ontario, Canada).

MITCH, MARK (1987) Research Associate—Environmental Science, Utah Water Research Laboratory. BA 1983 Hiram College (Ohio), MS 1986 Miami University (Ohio).

MITCHELL, HELEN D. (1982) Outreach Training Specialist and Program Administrator, Center for Persons with Disabilities. BS 1951 University of Utah, MS 1969, PhD 1970 Utah State University.

MITCHELL, KENNETH B. (1969) Academic Services/Facilities Coordinator, Academic Support Services; Asst. Student-Athlete Services Coordinator, Intercollegiate Athletics. BS 1965 Brigham Young University.

MITCHELL, PAMELA C. (1988) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1987 Utah State University.

MITCHELL, REBECCA S. (1985) Asst. Supervisor, 4-H Youth Programs, University Extension. BS 1966 Brigham Young University, MS 1972 Utah State University.

MITCHELL, SHARON K. (1992) Ext. Asst. Prof., Uintah Basin Branch Campus, Continuing Education. BA 1967 Stanford University, Sec. Ed. Teaching Cert. 1978 University of Utah, MS 1992 Utah State University.

MOAR, MAGGI E. (MARGARET M. SAPP) (1977) Lecturer, Theatre Arts and Health, Physical Education and Recreation. BFA 1961, MFA 1966 Texas Christian University.

MOE, SONDRA T. (1993) Supervising Teacher, USU Children's House. BS 1989 California State University (Fullerton), MS 1993 Utah State University.

MOFFITT, CLINTON GROVER (1987) Director of Disbursement Accounting, Controllers Office. BA 1977 Utah State University.

MOHAPATRA, SARITA (1995) Lecturer, Economics. BA 1987 B. J. B. College, Utkal University (Bhubaneswar, India), MBA 1989 Xavier Institute of Management (Bhubaneswar, India), PhD 1995 Utah State University.

MOLONEY, JANE FRANCES (1983) Teacher, Center for Persons with Disabilities. BS 1980 Tulane University, MA 1983 University of Maryland.

MONDAY, DEBORAH (1988) Teacher of String Bass, Music. MM 1979 University of Alabama.

MONSON, BEVERLY (1988) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1988 Brigham Young University.

MONSON, JAY ALBERT (1967) Dept. Head and Prof., Elementary Education. BS 1963 University of Utah, MS 1966 Arizona State University, EdD 1968 Utah State University.

MOON, TODD K. (1991) Asst. Prof., Electrical and Computer Engineering. BS 1988, MS 1988 Brigham Young University, PhD 1991 University of Utah.

MOORE, JAMES THOMAS (1993) Assoc. Director, High School/College Relations. BA 1975 Utah State University.

MOORE, TERRY K. (1984) Director, Parking and Visitor Information. BS 1983 University of Utah.

MOORE, WILLIAM MAYO (1978) Manager—Operations, Computer Services.

MORGAN, DANIEL PAUL (1976) Assoc. Prof., Special Education and Rehabilitation. BA 1968 Western Michigan State University, MS 1971 Michigan State University, PhD 1976 Florida State University. Sabb. 1-1-96 to 6-6-96.

MORGAN, ELIZABETH (1990) Research Instr., Communicative Disorders and Deaf Education. BS 1972 University of Tulsa, MA 1981 University of Northern Colorado.

MORGAN, ROBERT L. (1991) Research Asst. Prof., Special Education and Rehabilitation. BS 1973 Wichita State University, MS 1977 University of Kansas (Fort Hays), PhD 1991 Utah State University.

MORGAN, SUSAN K. (1987) Temp. Lecturer, Geology. BS 1979, MS 1987 Utah State University.

MORGAN, TRAVIS (1995) Asst. Director, Student Activities, Student Services. BA 1993 Utah State University.

MORIS, JON RUSSEL (1976) Prof., Sociology, Social Work and Anthropology; Adjunct Prof., Geography and Earth Resources. BS 1960 Seattle Pacific College, MA 1964, PhD 1970 Northwestern University.

MORREY, JOHN D. (1987) Research Assoc. Prof., Animal, Dairy and Veterinary Sciences; Chairman, Institutional Biosafety (RDNA) Committee. BS 1978, MS 1980 Brigham Young University, PhD 1982 Utah State University.

MORRIS, CHRISTOPHER H. (1995) Research Associate, Center for Persons with Disabilites. BA 1991 University of Missouri, MS 1995 Utah State University.

MORRIS, GLENN D. (1992) Asst. Director, Shingo Prize, College of Business. BA 1990, MS 1992 Utah State University.

MORRIS, SHANA R. (1991) Temp. Instr., Human Environments. BS 1987 University of North Carolina (Greensboro), MS 1990 Utah State University.

MORRIS, STEVEN R. (1992) Director of Corporate and Foundation Development, Institutional Development. BA 1972, MPA 1985 Brigham Young University.

MORRISON, NICHOLAS E. (1991) Asst. Prof., Music. BMEd 1986 University of North Carolina (Chapel Hill), MM 1988 University of Notre Dame, DM 1993 Florida State University.

MORRISON, ROBERT P. (1990) Assistant Librarian, Library and Information Services, Learning Resources Program. BA 1984 Syracuse University, MLS 1989 Simmons College Graduate School of Library and Information Science.

MORSE, DAVID E. (1971) Senior Research Engineer, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1970 Weber State College, ME 1974 Utah State University.

MORSE, WENDELL R. (1969) Director, Campus Planning and Engineering. BS 1967 Utah State University.

MORTENSEN, GENE L. (1994) Director, Technical Resources Laboratory, Space Dynamics Laboratory, USU Research Foundation. BS 1963 Utah State University.

MORTENSEN, JOANN (1981) Ext. Assoc. Prof. and Refugee Programs Agent (Sanpete), University Extension. BS 1973 Brigham Young University, MS 1975 Utah State University.

MORTENSEN, JOHN D. (1989) Assistant to the Vice President for Information and Budget Services, Enrollment Services, Student Services. BS 1987, MS 1989 Utah State University.

MOSER, ALMA P. (1961) Assoc. Dean and Ext. Program Leader, College of Engineering; Prof., Mechanical and Aerospace Engineering; International Programs Coordinator, College of Engineering. BS 1961, MS 1963 Utah State University, PhD 1967 University of Colorado.

MOSER, COURTNEY O. (1995) Assoc. Manager, Hub, Food Services. BA 1982 Utah State University.

MOTT, KEITH A. (1984) Prof., Biology. BS 1977 Union College, PhD 1982 University of Arizona.

MOURITSEN, RUSSELL H. (1994) Adjunct Assoc. Prof., Communication. BA 1969 Brigham Young University, MEd 1972, PhD 1980 University of Utah.

MOYER-MILEUR, LAURIE J. (1983) Adjunct Clinical Instr., Nutrition and Food Sciences. BS 1978, MS 1982 Utah State University.

MOYES, JANICE HOBBS (1983) Academic Adviser, Human Environments. BS 1977, MS 1982 Utah State University.

MUELLER, RICHARD JOHN (1982) Assoc. Prof., Biology. BA 1976 University of Wisconsin, PhD 1981 University of California.

MUNGER, RONALD G. (1994) Assoc. Prof., Nutrition and Food Sciences. BS 1977 Kansas State University, PhD 1984 University of Washington, M PH 1985 University of Washington (School of Public Health).

MUNN, CAROLYN R. (1990) Physical Therapist, Center for Persons with Disabilities. BS 1978 Northwestern University.

MURDOCH, ROBERT GUY (1974) Assoc. Librarian, Assoc. Director for Public Services, Library and Information Services, Learning Resources Program. BS 1973 Utah State University, MLS 1981 Brigham Young University.

MURDOCH, ROLAND G. (1968) Research Associate, Plants, Soils, and Biometeorology. BS 1958 Utah State University.

MURPHY, JOHN PAUL (1975) Ext. Instr. and Acting Supervisor, 4-H Youth Programs, University Extension. BS 1973, MS 1975 Utah State University.

MURRAY, JOYCE (1971) Asst. Prof., WSU/USU Cooperative Nursing Program; Adjunct Lecturer, Biology. BS 1959 University of Utah.

MURRI, BETTY (1995) Temp. Instr., Human Environments. BS 1972 Brigham Young University, MS 1980 Utah State University.

MUSSLER, HANS K. (1970) Prof. of German, Languages and Philosophy; Director, Language Laboratory. BA 1959 Brigham Young University, MA 1960 Yale University, PhD 1977 Johns Hopkins University.

MYETTE, BEVERLY (1985) RRC Program Specialist and Lecturer, Center for Persons with Disabilities. BS 1969 Emerson College, MEd 1973 Northwestern University.

NAFZIGER, MARK A. (1990) Staff Psychologist, Counseling Center, Student Services; Adjunct Asst. Prof., Psychology. BA 1983 Goshen College, MA 1986, PhD 1990 Ohio State University.

NAISER-HEDLUND, NIKKI (1985) Managing Editor, Scholarly Publications, USU Press and Scholarly Publications. BS 1977, MS 1984 Utah State University.

NAKANISHI, YOSHITAKA (1992) Adjunct Visiting Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1980, MS 1982, PhD 1989 Kyusha University.

NAKANO, DANIEL K. (1994) Asst. Prof., Mathematics and Statistics. AB 1986 University of California (Berkeley), MS 1990, PhD 1990 Yale University.

NALDER, LANNY J. (1969) Prof., Health, Physical Education and Recreation; Director, Human Performance Laboratory. BS 1963, MS 1965 Brigham Young University, PhD 1969 University of Utah.

NARAYANA, DHRUVA V. V. (1989) Visiting Research Prof., Utah Water Research Laboratory. PhD 1969 Utah State University.

NATE, COLLEEN (1985) Financial Specialist, Taggart Student Center.

NATH, MARGARET (PEGGY) ANN (1988) Senior Programmer/Analyst, Computer Services. BS 1977 Old Dominion University, MS 1987 Utah State University.

NEALE, CHRISTOPHER M. (1988) Assoc. Prof., Biological and Irrigation Engineering; Adjunct Assoc. Prof., Geography and Earth Resources. BS 1980 Escola de Engenharia Maua Sao Caentano do Sull (Sao Paulo, Brazil), MS 1983, PhD 1987 Colorado State University.

NEECE, JANIS G. (1993) Psychologist, Counseling, Student Services. BA 1979, MS 1982 University of Kentucky.

NEECE, JOHN A. (1993) Psychologist, Center for Persons with Disabilities; Adjunct Asst. Prof., Psychology. BA 1979, JD 1982 Baylor University, PhD 1993 Texas A&M University.

NEELEY, STEPHEN F. (1995) Development Director—Business, College of Business. BA 1984 Utah State University, MBA 1985 Northwestern University.

NEELY, ATSUKO (1991) Lecturer, Languages and Philosophy. BA 1987 Meiji Gakuin University (Japan).

NEELY, JOHN (1984) Assoc. Prof. and Graduate Program Coordinator, Art. BFA 1975 Alfred University, MFA 1982 Ohio University.

NEIGER, BRAD L. (1994) Adjunct Asst. Prof., Health, Physical Education and Recreation. BS 1983, MS 1984 Brigham Young University, PhD 1991 University of Utah.

NEILSON, LEILA M. (1995) Asst. Manager, University Inn.

NELSEN, D. RICHARD (1981) Specialist-Designer, Systems Division, Space Dynamics Laboratory, USU Research Foundation; Lecturer, Industrial Technology and Education. BS 1973 Utah State University.

NELSON, DANIEL R. (1988) Director, Southeastern Utah Center for Continuing Education (Moab); Ext. Asst. Prof. and Agriculture Agent (Grand), University Extension. BS 1978, MS 1987 Utah State University.

NELSON, DENNIS A. (1986) Assoc. Prof., Health, Physical Education and Recreation. BS 1976 Utah State University, MS 1977 Brigham Young University, EdD 1986 Oregon State University.

NELSON, FAROL ANN G. (1988) Lecturer, Child Development Lab, College of Family Life. BS 1974, MS 1976 Utah State University.

NELSON, IRVIN TOM (1992) Asst. Prof., School of Accountancy. BS 1977, MPrA 1978 University of Utah, PhD 1992 University of Nebraska.

NELSON, MARK D. (1995) Student-Athlete Services Coordinator, Intercollegiate Athletics. BS 1988, MS 1992 Bowling Green University.

NELSON, R. MARK (1987) Ext. Asst. Prof. and Beaver County Agent (Agriculture), University Extension. BS 1982, MS 1987 Utah State University.

NELSON, THORANA S. (1992) Assoc. Prof. and Director of Marriage and Family Therapy, Family and Human Development. BS 1979 University of Houston, MA 1982, PhD 1987 University of Iowa.

NELSON, VICTOR H. (1995) Adjunct Clinical Lecturer, Family and Human Development. BA 1970 Wartburg College, M Div 1974, STM 1985 Wartburg Theological Seminary.

NEMERE, ILKA M. (1995) Asst. Prof., Nutrition and Food Sciences. BA 1974 University of California (San Diego), PhD 1980 University of California (Los Angeles).

NEUENSWANDER, GARY L. (1987) Specialist—Media Production, Utah Agricultural Experiment Station. BA 1983 Brigham Young University.

NEWHALL, ROBERT LOUIS (1987) Research Associate, Plants, Soils, and Biometeorology. BS 1981, MS 1983 Utah State University.

NEWMAN, DONALD E. (1985) Video Engineer, Radio and TV Broadcasting, Multimedia and Distance Learning Services.

NICHOLLS, MICHAEL L. (1970) Assoc. Prof., History. BA 1966 Cedarville College, MA 1967 University of Dayton, PhD 1972 College of William and Mary.

NICHOLSON, JOHN K. (1979) Assoc. Prof., Landscape Architecture and Environmental Planning. BA 1970, MUP 1975 University of Kansas.

NIELSEN, DARWIN B. (1965) Prof. and Ext. Specialist, Economics. BS 1960, MS 1961 Utah State University, PhD 1964 Oregon State University.

NIELSEN, KATHLEEN (1985) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1979 Brigham Young University.

NIELSEN, KIMBERLY B. (1990) Supervisor, Custodial Services, Physical Plant.

NIELSEN, REED M., Jr. (1972) Assoc. Prof., Industrial Technology and Education. BS 1967, MS 1973 Utah State University.

NIELSON, JAY L. (1987) Asst. Director and Landscape Architect/Planner, Campus Planning and Engineering. BS 1972 Utah State University.

NIELSON, JOSEPH L. (1994) Career Counselor/Development Specialist, Class Division, Continuing Education. BS 1962 University of Utah, MEd 1967 University of Nevada (Las Vegas), PhD 1970 University of Utah.

NIEMINSKI, EVA C. (1994) Adjunct Assoc. Prof., Civil and Environmental Engineering. MS 1976 Warsaw Technical University, MS 1983 University of Notre Dame, PhD 1985 Utah State University.

NILSON, KAY M. (1990) Adjunct Prof., Nutrition and Food Sciences. BS 1953, MS 1956 Utah State University, PhD 1966 University of Nebraska.

NISHI, ELLEN C. (1987) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1975 University of Wyoming.

NOBLE, SHERI N. (1986) Adjunct Prof. and Adviser, Elementary Education. BS 1970, MEd 1981 Utah State University.

NOLAN, RENEE' H. (1993) Specialist, Center for Persons with Disabilities. BA 1992 Utah State University.

NORTHERNER, SARA J. (1991) Asst. Prof., Art. BFA 1986 Washington University, MFA 1990 Cranbrook Academy of Art.

NORTON, BRIEN E. "BEN" (1972) Assoc. Prof., Rangeland Resources; Director, International Institute of Range Management; International Programs Coordinator, College of Natural Resources. B. Rur. Sc. 1964, PhD 1971 University of New England, Australia.

NORTON, DAVID G. (1987) Adjunct Prof., Mechanical and Aerospace Engineering. BS 1964, MS 1967 Utah State University, PhD 1973 University of Colorado.

NORTON, JEANETTE M. (1993) Asst. Prof., Plants, Soils, and Biometeorology. BS 1980 State University of New York (Syracuse), PhD 1991 University of California (Berkeley).

NORTON, MARIA (1982) Project Manager, Cache County Study on Memory and Aging, College of Family Life. BS 1980 University of California (Davis), MS 1982 Utah State University.

NORTON, PAUL M. (1992) Vice President for University Relations and Development. BS 1967 Utah State University, MS 1968 Syracuse University.

NOYES, MARILYN BJORKMAN (1976) Assoc. Prof. and Ext. Specialist, Human Environments. BS 1955 University of Utah, MS 1971 Utah State University, PhD 1982 Colorado State University.

OAKESON, KATHLEEN F. (1989) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1963 University of Utah.

OAKS, ROBERT Q., Jr. (1966) Prof., Geology. BA 1960 Rice University, PhD 1965 Yale University.

OBERG, CRAIG J. (1993) Adjunct Prof., Nutrition and Food Sciences. BS 1979 Weber State College, PhD 1985 Utah State University.

O'CONNOR, CAROL ANN (1977) Assoc. Dept. Head, Director of Graduate Studies, and Prof., History. BA 1967 Manhattanville College, M Phil 1970, PhD 1976 Yale University.

ODEH, MUFEED (1995) Adjunct Asst. Prof., Civil and Environmental Engineering. BS 1982, MS 1984 University of Missouri (Columbia), PhD 1988 Utah State University.

O'DELL, J. DENNIS (1985) Medical Director, Center for Persons with Disabilities; Adjunct Assoc. Prof., Biology. BS 1971 Brigham Young University, MD 1975 University of Chicago Pritzker School of Medicine.

OGLIVIE, SUZANNE MARY (1988) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1971, MS 1976 Brigham Young University.

OHLHORST, SHARON L. (1982) Research Asst. Prof., Geography and Earth Resources; Adjunct Asst. Prof., Geology; Coordinator of Outreach Education, College of Natural Resources. BS 1969 University of Wisconsin, MS 1972, PhD 1980 Yale University.

OLSEN, EDWIN C., III (1968) Assoc. Prof., Biological and Irrigation Engineering; Director, International Irrigation Center. BS 1959, PhD 1965 Utah State University.

OLSEN, ERIC (1995) Project Leader, Geography and Earth Resources. BA 1989, MA 1992 Utah State University.

OLSEN, RICHARD K. (1967) Assoc. Dept. Head and Prof., Chemistry and Biochemistry. BA 1960 Brigham Young University, MS 1963, PhD 1964 University of Illinois.

OLSEN, RONDA H. (1985) Ext. Assoc. Prof. and Uintah County Agent (Home Economics), University Extension. BS 1972 Utah State University, MS 1977 University of Arizona.

OLSEN, SHAWN H. (1981) Ext. Assoc. Prof. and Davis County Agent, University Extension. BS 1977 Brigham Young University, MS 1980 Iowa State University.

OLSON, CHARLES L. (1981) Registrar, Enrollment Services. BS 1965 Brigham Young University.

OLSON, GERALD RAY (1956) Prof., Assoc. Vice President for University Extension. BS 1956 Utah State University, MEd 1963 Colorado State University, PhD 1970 North Carolina State University.

OLSON, GORDON M. (1989) Adjunct Clinical Lecturer, Communicative Disorders and Deaf Education. BS 1965 University of Washington.

OLSON, KENNETH C. (1992) Assoc. Prof., Animal, Dairy and Veterinary Sciences; Adjunct Assoc. Prof., Rangeland Resources. BS 1979, MS 1982 Montana State University, PhD 1986 Utah State University.

OLSON, TERRANCE D. (1987) Adjunct Prof., Family and Human Development. BS 1967, MS 1969 Brigham Young University, PhD 1972 Florida State University.

O'NEILL, MICHAEL P. (1990) Asst. Prof., Geography and Earth Resources. BA 1981 University of Maryland, MA 1983, PhD 1987 University of Buffalo.

O'NEILL, WENDE A. (1990) Assoc. Prof., Civil and Environmental Engineering; Adjunct Assoc. Prof., Geography and Earth Resources. BA 1981 Mt. Holyoke College, MA 1983, PhD 1987 State University of New York (Buffalo).

OPENSHAW, D. KIM (1981) Assoc. Prof., Marriage and Family Therapist, Family and Human Development; Adjunct Assoc. Prof., Psychology; Chairman, Committee on Human Subjects. BA 1973 University of Utah, MSW 1976 University of Utah, PhD 1978 Brigham Young University.

OR, DANI (1993) Asst. Prof., Plants, Soils, and Biometeorology; Adjunct Asst. Prof., Biological and Irrigation Engineering. BS 1985, MS 1987 Hebrew University of Jerusalem, PhD 1990 Utah State University.

O'ROURKE, NANCY (1987) Senior Lecturer, English. BA 1971 University of Wyoming, MA 1981 University of Arizona.

OSBORNE, J. GRAYSON (1969) Prof., Psychology; Director, Psychology Human Behavior Laboratory. BA 1961, MA 1964, PhD 1968 Arizona State University.

OSBORNE, JANET L. (1979) Director, Women's Center for Life-long Learning; Adjunct Asst. Prof., Sociology, Social Work and Anthropology. BA 1962, MA 1966 Arizona State University, PhD 1988 Utah State University.

OUJIRI, TIMON M., CPT (1990) Asst. Prof., Military Science. BA 1980 Pittsburg State University, MS 1986 University of Southern California.

PACKHAM, MICHAEL (1992) Teacher of French Horn, Music. BA 1970, MM 1971 Utah State University.

PAGE, MARY ANN (1989) Ext. Asst. Prof. and Washington County Agent, University Extension. BS 1961, MS 1975 Brigham Young University.

PAINTER, REED B. (1966) Senior Librarian, Cataloger, Merrill Library and Learning Resources Program. BS 1953, MS 1956 Utah State University, MA 1966 University of Denver.

PALMBLAD, IVAN G. (1966) Prof., Biology. BS 1960 Portland State College, PhD 1966 University of Washington.

PALMER, DANIEL G. (1995) Temp. Lecturer, Industrial Technology and Education. BS 1984 Utah State University, MS 1988 Colorado State University.

PALMER, KAREN S. (1995) Research Assistant, Center for Persons with Disabilities. BPE 1980 University of Calgary (Alberta, Canada), MPH 1990, MS 1991, Certificate in Urban and Regional Planning 1991 University of Hawaii (Manoa).

PAN, CHING-YAN (1989) Research Assoc. Prof., Physics. BS 1968 Shanghai Normal University (Shanghai, China), MS 1982 University of Houston, PhD 1987 Utah State University.

PANJA, KIRAN V. (1994) Research Engineer, Utah Water Research Laboratory. BS 1989 Nagarjuna University, MS 1994 Utah State University.

PANTER, KIP E. (1986) Adjunct Assoc. Prof., Animal, Dairy and Veterinary Sciences. BS 1975, MS 1978 Utah State University, PhD 1983 University of Illinois.

PAPER, DAVID J. (1994) Asst. Prof., Business Information Systems and Education. BA 1982 Southern Illinois University, MBA 1987 Arizona State University, PhD 1995 Southern Illinois University.

PAPPAS, JOHN M. (1986) Asst. Director of Support Services, Physical Plant. BS 1969 Utah State University.

PARENT, C. R. MICHAEL (1972) Assoc. Dean for Graduate Programs, College of Business; Prof., Business Administration. BA 1968 Fresno State College, MBA 1969 Michigan State, PhD 1972 University of Oregon.

PARK, JOHNGSEH (1990) Adjunct Research Associate, College of Humanities, Arts and Social Sciences. BA 1963 The Hankuk University of Foreign Studies, MA 1977 Seoul National University.

PARKER, EVAN P. (1990) Lecturer, Agricultural Systems Technology and Education. BS 1988, MS 1990 Utah State University.

PARKER, ELIZABETH (1990) Clinical Instr., Communicative Disorders and Deaf Education. BA 1980, MEd 1981 University of Utah.

PARKER, VERNON D. (1988) Dept. Head and Prof., Chemistry and Biochemistry. BA 1960 University of Minnesota, PhD 1964 Stanford University.

PARKINSON, ANNE B. (1991) Ext. Asst. Prof. and Millard County Agent, University Extension. BS 1972, MS 1991 Utah State University.

PARKINSON, STUART WICKS (1986) TV Producer/Director, Multimedia and Distance Learning Services; Adjunct Lecturer, Communication. BA 1977 Murray State University (Kentucky).

PARLIN, BRADLEY W. (1973) Prof. and Director of Institute for International Rural and Community Development, Sociology, Social Work and Anthropology. BA 1965 Indiana University, MA 1967, PhD 1972 University of Illinois.

PARLIN, MARY ANN (1993) Publications Specialist/Editor, Communicative Disorders and Deaf Education. BS 1983, BS 1986, MS 1993 Utah State University.

PARRISH, MARDELL C. (1987) Specialist, Utah Water Research Laboratory. BA 1970 Utah State University, MA 1986 University of British Columbia.

PARRY, JAMES D. (1984) RRC Outreach Specialist, Center for Persons with Disabilities. BS 1972, MA 1973 University of South Dakota.

PARSON, ROBERT E. (1987) Director of Utah History Fair, Adjunct Asst. Prof., and Asst. Archivist, History. BS 1981, MS 1983 Utah State University.

PASKETT, BRENT W. (1994) Accountant, Accounting and Financial Reporting, Controllers Office. BA 1982 Utah State University, MBA 1992 University of Phoenix.

PASKETT, MICHAEL E. (1991) Supervisor, R. A. Smart Veterinary Diagnostics Lab, Animal, Dairy and Veterinary Sciences. BS 1968 Weber State College.

PAVASUTHIPAISIT, KANOK (1995) Adjunct Prof., Animal, Dairy and Veterinary Sciences. BS 1968, MD 1970, PhD 1974 Mahidol University (Thailand).

PAYNE, JOHN C. (1995) Development Director, Learning Resources Program. BS 1977, MBA 1978 Utah State University.

PEAK, DAVID (1994) Prof., Physics. BS 1965 State University College (New Paltz), PhD 1969 State University of New York (Albany).

PEAK, TERRY L. (1994) Asst. Prof., Sociology, Social Work and Anthropology. BA 1972 State University of New York (Buffalo), MSW 1987, PhD 1993 State University of New York (Albany).

PEASE, EDWARD C. (1994) Dept. Head and Prof., Communication. BA 1978 University of New Hampshire, MS 1981 University of Minnesota, PhD 1991 Ohio University.

PEATROSS, DARRELL K. (1984) Specialist—Adult Handicapped, Center for Persons with Disabilities. BS 1984 Utah State University.

PECK, NORMA JEAN (1990) Specialist, Center for Persons with Disabilities. BS 1973 Brigham Young University.

PECK, RALPH LYNN (1978) Instr., School of Accountancy. BA 1964, MS 1970 Arizona State University, CPA 1971 State of Nevada.

PEHRSON, CONNIE (1994) Specialist, SKI*HI/Communicative Disorders and Deaf Education. BA 1972 Central Washington State University (Ellensburg).

PEMBERTON, JANE B. (1995) Asst. Prof., Uintah Basin Branch Campus, Continuing Education. BS 1965, MA 1981 Kansas State University, PhD 1994 University of New Mexico.

PENDLETON, WILLIAM R. (1966) Prof., Physics and Science Division, Space Dynamics Laboratory, USU Research Foundation. AB 1959 William Jewell College, PhD 1964 University of Arkansas. Sabb. 7-1-95 to 6-30-96.

PERALTA, RICHARD C. (1988) Prof., Biological and Irrigation Engineering; Water Quality Specialist, University Extension. BS 1971 University of South Carolina, MS 1976 Utah State University, PhD 1979 Oklahoma State University.

PERKES, SIDNEY G. (1967) Dept. Head and Prof., Theatre Arts. BA 1963 Utah State University, MA 1972 University of Illinois.

PERKINS, ROGER L. (1994) Instr., Geography and Earth Resources. BS 1978 Campbell University, MA 1987 Boston University.

PERRETT, DEBBIE (1994) Counselor, Financial Aid Office. BS 1994 Utah State University.

PERRIER, GREGORY K. (1991) Adjunct Asst. Prof., Rangeland Resources. BS 1973, MS 1980 University of California (Davis), PhD 1991 Utah State University.

PETERSEN, CALVIN R. (1980) Adjunct Asst. Prof., Psychology. BS 1965, MS 1969, PhD 1971 University of Utah.

PETERSEN, HAROLD CRAIG (1973) Acting Assoc. Provost, Provost's Office; Prof., Economics. BS 1968 Utah State University, MS 1969, PhD 1973 Stanford University.

PETERSEN, MARIA E. (1995) Temp. Instr., Languages and Philosophy. BA 1986, MA 1994 Utah State University.

PETERSON, ADRIENNE PATRICIA (1974) Physical Therapist and Lecturer, Center for Persons with Disabilities. BS 1971 St. Louis University.

PETERSON, ANDREA M. (1984) Asst. Director, Writing Center, English. BS 1962, MA 1964 Utah State University.

PETERSON, CRAIG J. (1992) Lecturer, Business Information Systems and Education. BS 1990, MS 1992 Utah State University.

PETERSON, DARCIE L. (1993) Adviser, Special Education and Rehabilitation. BS 1983 Western Oregon State College, MEd 1987 Utah State University.

PETERSON, F. ROSS (1971) Prof., History; Director, Mountain West Center for Regional Studies. BS 1965 Utah State University, PhD 1968 Washington State University. Sabb. 9-11-95 to 6-8-96.

PETERSON, GLORIA (1994) Adjunct Instr., Human Environments.

PETERSON, HELENE (1987) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1949 Cornell University.

PETERSON, JACK W. (1987) Temp. Instr., School of Accountancy. BS 1975, MBA 1976 Utah State University.

PETERSON, KAREN W. (1979) Director of the Student Service Center, Dean's Office, College of Business. BS 1979, MS 1988 Utah State University.

PETERSON, KEN (1993) Dept. Head and Prof., Aerospace Studies. BS 1973 Brigham Young University, MA 1981 Central Michigan University.

PETERSON, KENNETH A. (1980) Asst. Athletic Director—Business Affairs, Intercollegiate Athletics. BS 1976, BS 1980 Utah State University.

PETERSON, KENNETH M. (1972) Director, Inventories, Insurance, and Property Controls. BS 1963 University of Utah, CPA 1964 State Of Utah.

PETERSON, MAX P. (1967) Senior Librarian and Director, Library and Information Services. Learning Resources Program. BS 1960, MS 1966 Utah State University.

PETERSON, PATTY SLATER (1985) Adjunct Instr., Nutrition and Food Sciences. BS 1980, MS 1981 University of Utah.

PETERSON, SHERI E. (1981) Catalog Editor and Publication Specialist, Editorial Services. BA 1978 Brigham Young University.

PETERSON, SYDNEY M. (1994) Administrative Assistant, College of Humanities, Arts and Social Sciences. BS 1973 Brigham Young University, MS 1989 Utah State University.

PETERSON, TAMARA M. (1995) Supervisor, Utah Water Research Laboratory. BS 1995 Utah State University.

PETERSON, TOM C. (1976) Assoc. Prof., Human Environments. BS 1972, MS 1974 Utah State University, PhD 1980 Colorado State University.

PETRINO, PAUL V. (1995) Asst. Football Coach, Intercollegiate Athletics. BS 1989 Carroll College (Helena, Montana).

PETRINO, ROBERT P. (1995) Asst. Football Coach, Intercollegiate Athletics. BA 1994 Carroll College (Helena, Montana).

PETTIGREW, TAMMY N. (1991) Adjunct Clinical Instr., Special Education and Rehabilitation. BA 1975, MEd 1990 Utah State University.

PETTIT, DONALD R. (1990) Adjunct Assoc. Prof., Physics. BS 1978 Oregon State University, PhD 1983 University of Arizona.

PFISTER, ROXANE S. (1991) Computer Specialist, College of Family Life. BFA 1974, MS 1991 Utah State University.

PHILLIPS, BARBARA E. (1989) Administrative Assistant, Center for Atmospheric and Space Sciences and Physics.

PHILLIPS, DALLIN J. (1990) Asst. Director, Career Services and Cooperative Education. BA 1977 Utah State University, Juris Doctorate 1981 University of Idaho.

PHILLIPS, G. KEVIN (1980) Manager—Warehousing, Physical Plant. BS 1977 Utah State University.

PHILLIPS, WARREN F. (1972) Prof., Mechanical and Aerospace Engineering. BS 1966, MS 1967, PhD 1970 University of Michigan.

PIERCE, DALPHIA RAYE (1990) Asst. Prof., Secondary Education. BA 1972 Texas Tech., MEd 1982, EdD 1987 University of Houston.

PIERSON, FREDERICK B., Jr. (1994) Adjunct Assoc. Prof., Rangeland Resources. BS 1983 Humboldt State University, MS 1985, PhD 1988 Washington State University.

PITCHER, BRIAN L. (1978) Dean, College of Humanities, Arts and Social Sciences; Prof., Sociology, Social Work and Anthropology. BS 1973, MS 1974 Brigham Young University, PhD 1978 University of Arizona.

PITKIN, WILLIS LLOYD, Jr. (1973) Prof., English. AB 1958, AM 1966, PhD 1973 University of Southern California.

PITTMAN, PAULA (1989) Specialist, SKI*HI Institute, Communicative Disorders and Deaf Education. BS 1985 Central State University (Oklahoma), MEd 1989 Utah State University.

PLOWMAN, R. DEAN (1984) Prof., Animal, Dairy and Veterinary Sciences. BS 1951 Utah State University, MS 1955, PhD 1956 University of Minnesota.

PODGORSKI, GREGORY J. (1988) Assoc. Prof., Biology. BA 1976 St. Michael's College (Burlington, VT), MS 1979, PhD 1983 Pennsylvania State University.

POE, STEPHEN E. (1989) Assoc. Prof., Agricultural Systems Technology and Education, Biological and Irrigation Engineering; Structures Specialist, University Extension. BS 1980, MS 1981, PhD 1987 Purdue University.

POLEJAEVA, IRINA (1994) Postdoctoral Fellow, Animal, Dairy and Veterinary Sciences. MS 1985 Kuban Agricultural Institution (Russia), PhD 1993 Russian Research Institute of Animal Husbandry.

POND, LESLIE (1993) Specialist, Center for Persons with Disabilities. BA 1974 University of Denver, Utah Teacher Certificate (Severe Multi-handicapped) 1991 Utah State University.

POPENDORF, WILLIAM J. (1995) Prof., Biology. BS 1965, MS 1970, MPH 1971, PhD 1976 University of California (Berkeley).

POPPLETON, GARY STENNETT (1980) Director, Independent Study; Director, Marketing and Production Design for Continuing Education, Continuing Education; Adjunct Asst. Prof., Instructional Technology. BS 1971, MEd 1979 Utah State University.

POSTHOFEN, RENATE (1995) Asst. Prof., Languages and Philosophy. BA 1991 Grobes Latinum (Frankfurt, Germany), MA 1985 University of Pittsburgh, PhD 1993 State University of New York (Albany).

POULSEN, LYNN JAMES (1976) Asst. Vice President, Student Services. BS 1968 Brigham Young University, MEd 1971 Idaho State University.

POULSEN, S. KIRT (1995) Compliance/Training Manager, Environmental Health and Safety. BS 1990, BS 1991 Utah State University.

POWELL, GEORGE E. (1994) Research Engineer, Electrical and Computer Engineering. BS 1991, MS 1993 Utah State University.

POWELL, JAMES (1991) Asst. Prof., Mathematics and Statistics. BS 1985 Colorado State University, PhD 1990 University of Arizona.

POWERS, LINDA S. (1988) Prof., Electrical and Computer Engineering, Biological and Irrigation Engineering; Adjunct Prof., Chemistry and Biochemistry, Physics. BS 1970 Virginia Polytechnic Institute, MS 1972, PhD 1976 Harvard University.

PRANTE, FRANKLIN C. (1979) Director, Small Business Development Center, Economics. BS 1973 Brigham Young University, MBA 1976 Northwestern Graduate School of Management.

PRANTIL, MARSHA G. (1991) Project Manager, Youth Programs, University Extension. BS 1968 Utah State University.

PRATT, JEAN A. (1995) Research Associate, Instructional Technology. BS 1991 University of Idaho, MS 1995 Utah State University.

PRESTON, JANET E. (1976) Prof., Human Environments. BS 1955 Utah State University, MEd 1972 University of Utah, PhD 1982 Colorado State University.

PRESTON, PATRICIA O'BRIEN (1983) Undergraduate Adviser, Psychology. BS 1956 University of Utah.

PRICE, FRANCIS W. (1979) Ext. Instr. and San Juan County Agent (Home Economics), University Extension. BS 1958 Utah State University.

PRICE, JAY H., Jr. (1988) Arthur Andersen Executive Prof., School of Accountancy. BS 1949 University of Wisconsin (Madison), CPA 1949 Wisconsin.

PRICE, T. BRENT (1995) Adjunct Clinical Asst. Prof., Family and Human Development. BS 1969 Weber State College, MS 1971 University of Utah, PhD 1980 University of Denver.

PROCTOR, DEBRA G. (1980) Ext. Instr. and Wasatch County Agent (Home Economics), University Extension. BS 1980 Utah State University.

PROCTOR, LUCILE H. (1987) Ext. Instr., Garfield County Home Economics, 4-H, and Youth Agent, University Extension. BS 1961 Brigham Young University.

PROVENZA, FREDERICK D. (1981) Prof., Rangeland Resources. BS 1963 Colorado State University, MS 1978 Utah State University.

PUGMIRE, M. RANCE (1995) Asst. Director, Intercollegiate Athletics. BS 1987 University of Idaho.

PYKE, DAVID A. (1992) Adjunct Asst. Prof., Rangeland Resources. BS 1976, MS 1977, PhD 1983 Washington State University.

RAHMEYER, WILLIAM J. (1985) Prof., Civil and Environmental Engineering and Utah Water Research Laboratory. BCE 1975, MS 1975, PhD 1980 Colorado State University.

RAHIMI, DIANA A. (1985) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1976 Utah State University.

RAITT, WILLIAM JOHN (1976) Dept. Head and Prof., Physics. BSc 1959, PhD 1963 King's College, University of London, England.

RAJAGOPAL, REMANI (1987) Publication Specialist and Head—Copy Centers, Publication Design and Production.

RAKOWSKI, ANDREW E. (1992) Manager—Remote Sensing GIS Laboratory, Geography and Earth Resources. BS 1980 State University of New York (Buffalo).

RALLISTON, LISA (1988) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1986 University of Utah.

RAMSEY, R. DOUGLAS (1989) Assoc. Prof., Geography and Earth Resources; Adjunct Assoc. Prof., Rangeland Resources. BS 1982, MS 1983 Brigham Young University, PhD 1989 University of Utah.

RANDLE, PAUL A. (1970) Prof., Business Administration. BS 1965, MBA 1967 University of Utah, PhD 1970 University of Illinois.

RASMUSSEN, DONALD R. (1977) Supervisor, Engineering Research Shop, Systems Division, Space Dynamics Laboratory, USU Research Foundation.

RASMUSSEN, GEORGE ALLEN (1989) Assoc. Prof., Rangeland Resources; Range Management Specialist, University Extension. BS 1979, MS 1981 Texas A&M University, PhD 1986 Texas Tech University.

RASMUSSEN, H. PAUL (1988) Assoc. Vice President of Research; Assoc. Dean for Research, College of Agriculture; Director, Utah Agricultural Experiment Station; Prof., Plants, Soils, and Biometeorology. BS 1961 Utah State University, MS 1962, PhD 1965 Michigan State University.

RASMUSSEN, KATHLEEN R. (1989) Adjunct Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1980, MS 1983 Texas A&M University, PhD 1988 Texas Tech University Health Sciences Center.

RASMUSSEN, V. PHILIP (1981) Dept. Head and Prof., Plants, Soils, and Biometeorology; Asst. Director, Utah Agricultural Experiment Station; Asst. Director, Extension Service. BS 1974, MS 1976 Utah State University, PhD 1979 Kansas State University.

RATLIFF, RICHARD L. (1990) Arthur Andersen Alumni Prof. and Director of Research, School of Accountancy. BA 1966 Texas Christian University, MA 1972 University of Texas (Austin), PhD 1979 University of North Carolina (Chapel Hill), CIA 1986 Institute of Internal Auditors.

RATNAYAKE, LAKSHMAN L. (1995) Adjunct Assoc. Prof., Civil and Environmental Engineering. BE 1973 University of Sri Lanka, MS 1977 University of Birmingham.

RAWLEY, LEE ANN (1974) Asst. Director and Principal Lecturer, Intensive English Language Institute. BA 1970 Utah State University, MA 1986 Utah State University.

RAWSON, KAY T. (1995) Adjunct Asst. Prof., Human Environments. BS 1961 Brigham Young University, MEd 1980 Weber State College, PhD 1994 Utah State University.

READ, VICKI (1993) Patron Services Specialist, Library and Information Services, Learning Resources Program. BA 1985, MA 1991 Utah State University.

REAM, ELISABETH E. (1978) Adjunct Clinical Instr., Nutrition and Food Sciences. BS 1966 Brigham Young University, MS 1971 Utah State University.

REDD, FRANK J. (1984) Dept. Head and Prof., Mechanical and Aerospace Engineering; Director, Small Spacecraft, Systems Division, Space Dynamics Laboratory, USU Research Foundation; Director, Center for Space Engineering; Director, Rocky Mountain Space Grant Consortium. BS 1957 West Point, MS 1966 Stanford University, PhD 1975 Brigham Young University.

REDDY, MOHAN I. (1988) Research Asst. Prof., Nutrition and Food Sciences. BS 1975 Andhra Pradesh Agricultural University (India), MS 1978, PhD 1985 Central Food Technological Research Institute (India).

REDINBAUGH, MARGARET G. (1995) Adjunct Assoc. Prof., Plants, Soils, and Biometeorology. BS 1977, MS 1980, PhD 1984 State University of New York (Albany).

REDING, MICHAEL (1995) IPM Project Leader, Biology. BS 1985 State University of New York (Oswego), MS 1990 Miami University (Oxford, Ohio).

REED, JOHN WILLIAM (1983) Research Technologist, Stewart Radiance Laboratory, Space Dynamics Laboratory, USU Research Foundation. BS 1954 University of Missouri.

REEDER, PAUL L. (1993) Adjunct Prof., Physics. BA 1958 College of Wooster (Wooster, Ohio), PhD 1963 University of California (Berkeley).

REES, DAVID (1995) Research Scientist, Center for Atmospheric and Space Sciences. BA 1963 Swansea University, PhD 1967 University College (London).

REESE, DIANE J. (1990) Ext. Instr. and Southwest District Dept. Head, University Extension. BS 1967 Utah State University.

REESE, JULENE (1995) Extension Marketing Coordinator, Information News Services.

REEVE, EDWARD M. (1987) Assoc. Prof., Industrial Technology and Education. BS 1978, MA 1979, PhD 1986 Ohio State University.

REEVE, KEVIN LEONARD (1991) Systems Specialist, Multimedia and Distance Learning Services, Learning Resources Program. BS 1990 Utah State University.

REEVE, THOMAS ANDREW (1977) Ext. Assoc. Prof. and Box Elder County Agent (Agriculture), University Extension. BS 1962, MS 1964 Utah State University.

REID, CHAD RICHARD (1991) Ext. Asst. Prof. and Uintah County Agent, University Extension. BS 1985 Southern Utah State University, MS 1990 University of Nevada (Reno).

REINHORN, LESLIE J. (1994) Asst. Prof., Economics. BA 1987 Queen's University (Canada), PhD 1994 Stanford University.

REISER, RAMON F. (1993) Research Associate, Instructional Technology. BA 1963 University of Santa Clara (California).

REUVENI, JOSEPH (1995) Postdoctoral Fellow, Plants, Soils, and Biometeorology. BS 1974, MS 1977, PhD 1987 The Hebrew University of Jerusalem.

REYNOLDS, MARY LOU (1992) Adviser, Health, Physical Education and Recreation. BA 1979, MEd 1982 Brigham Young University.

RHEES, KAYE (1980) Teacher, Edith Bowen Laboratory School; Adjunct Instr., Elementary Education. BS 1975, MEd 1980 Utah State University.

RHODES, CAROLYN (1983) Assoc. Prof. and Asst. Dept. Head, Political Science. BS 1975, MS 1980 Utah State University, ABD 1983, PhD 1987 Brandeis University.

RICHARDS, GAYLE G. (1994) Adjunct Asst. Prof., Special Education and Rehabilitation. BA 1959, MA 1961, PhD 1970 University of Utah.

RICHARDS, JAMES H. (1979) Adjunct Assoc. Prof., Rangeland Resources. BS 1970 California Institute of Technology, PhD 1979 University of Alberta.

RICHARDS, JOSEPH W. (1992) Ext. Asst. Prof., Uintah Basin Branch Campus, Continuing Education. BA 1967, MA 1969 Brigham Young University, PhD 1976 University of California (Davis).

RICHARDS, SUSAN M. (1993) Temp. Lecturer, Business Information Systems and Education. BS 1989, MS 1993 Utah State University.

RICHINS, PEG A. (1994) Administrator of Telecommunications/Conferences, Conference and Institute Division, Continuing Education. BS 1978 Utah State University.

RICHMOND, JANET E. (1995) Postdoctoral Fellow, Biology. BS 1982 Sussex University, PhD 1989 University of Calgary.

RIDENHOUR, BEVERLY (1981, 1983) Principal Lecturer, Mathematics and Statistics. BS 1967, MS 1969 Central Missouri State College.

RIDENHOUR, JERRY (1981) Dept. Head and Prof., Mathematics and Statistics. BS 1966, MA 1967 Central Missouri State College, PhD 1971 Arizona State University.

RIEBECK, FRED J. (1977) Research Technologist, Systems Division, Space Dynamics Laboratory, USU Research Foundation.

RIFFE, D. MARK (1993) Asst. Prof., Physics. BS 1981 Wake Forest University, MS 1984, PhD 1989 Cornell University.

RIGGS, KATHLEEN (1982) Ext. Asst. Prof. and Iron County Agent (Home Economics), University Extension. BS 1978, MS 1991 Brigham Young University.

RIGLING, DANIEL (1989) Postdoctoral Fellow, Biology. Diploma 1982 Federal Technical University (Zurich, Switzerland), PhD 1988 University of Zurich.

RILEY, COLLEEN A. (1989) Manager of Engineering Proposals, Utah Water Research Laboratory. BS 1983, MS 1988 Utah State University.

RILEY, PAMELA JO (1975) Prof., Sociology, Social Work and Anthropology; Director, Women's Studies; International Programs Coordinator, Women in Development, College of Humanities, Arts and Social Sciences. BA 1969, MA 1972 Arizona State University, PhD 1975 Washington State University.

RINGLE, JOHN E. (1988) Asst. Director, Housing Services, Auxiliary Enterprises. BA 1977, MPA 1988 University of Massachusetts.

RISK, THOMAS MUIR (1991) Specialist, Center for Persons with Disabilities. BS 1983, MEd 1989 Utah State University.

RITCHIE, MARK E. (1991) Asst. Prof., Fisheries and Wildlife. AB 1981 Indiana University (Bloomington), MS 1983, PhD 1987 University of Michigan (Ann Arbor).

RIVERA, ORLANDO (1991) Adjunct Prof., Special Education and Rehabilitation. BA 1955 Adams State College, MS 1959, PhD 1974 University of Utah.

ROBBINS, CHARLES W. (1988) Adjunct Prof., Plants, Soils, and Biometeorology. BS 1966 Brigham Young University, MS 1970, PhD 1979 Utah State University.

ROBBINS, LENORE (1990) Ext. Asst. Prof. and Davis County Agent, University Extension; Adjunct Asst. Prof., Human Environments. BS 1978 Utah State University, MS 1984 Brigham Young University, PhD 1993 Utah State University.

ROBINS, KATHLEEN (1993) Adjunct Asst. Prof., Special Education and Rehabilitation. BS 1972, MEd 1973, MS 1982, PhD 1987 University of Utah.

ROBERTS, ADRIE J. (1990) Ext. Instr. and Assoc. County Agent (Beaver), University Extension. BS 1980 Utah State University.

ROBERTS, DAVID WILLIAM (1984) Assoc. Prof., Forest Resources; Adjunct Assoc. Prof., Geography and Earth Resources. BS 1977, MS 1980 University of Montana, PhD 1984 University of Wisconsin.

ROBERTS, NANCY (1993) Systems Specialist, Computer Services. BS 1989 Idaho State University.

ROBERTS, RICHARD N. (1988) Prof., Psychology; Director of Evaluation and Research, Center for Persons with Disabilities. BS 1968 Columbia University, MSW 1974, PhD 1977 University of Hawaii. Sabb. 1-1-96 to 9-30-96.

ROBINETTE, SHARON B. (1990) Asst. Director, Financial Aid Office. BS 1985 Utah State University.

ROBINSON, CLAY W. (1995) Postdoctoral Fellow, Animal, Dairy and Veterinary Sciences. BS 1987 Southern Utah State University, DVM 1992 Oregon State/Washington State University.

ROBINSON, KATHLEEN (1994) Program Administrator, Southeastern Utah Center for Continuing Education, Continuing Education. BS 1993 Utah State University.

ROBINSON, MICHAELLE ANN (1986) Interdisciplinary Training Specialist, Center for Persons with Disabilities. BS 1964 University of Oregon, MS 1969 University of Utah.

ROBINSON, SYLVIA (1987) Outreach Academic Adviser, Elementary Education and Class Division, Continuing Education. BS 1967 Utah State University.

ROBSON, KENT ELMER (1969) Dept. Head and Prof., Languages and Philosophy. BA 1962 University of Utah, PhD 1974 Stanford University.

ROBSON, ROSS E. (1979) Assoc. Dean for Business Relations, College of Business; Assoc. Prof., Management and Human Resources; Adjunct Assoc. Prof., Political Science. BS 1965 Weber State College, MS 1967 Utah State University, PhD 1973 University of Maryland.

ROCHLITZ, KEVIN MARK (1995) Asst. Athletic Director—Marketing and Promotions, Intercollegiate Athletics. BS 1993 University of Wyoming.

RODERICK, LEE (1994) Assoc. Vice President for University Relations; Director, Information News Services; Adjunct Assoc. Prof., Communication. BS 1966 Utah State University, MA 1970 George Washington University.

ROE, ALAN H. (1988) Computer Programmer, Biology. BS 1979, MS 1986 Utah State University.

ROGERS, DAVID L. (1986) Assoc. Dean for Extension, College of Humanities, Arts and Social Sciences; Prof., Sociology, Social Work and Anthropology; Supervisor, Community Development Programs, University Extension. BS 1963, MS 1964 Utah State University, PhD 1968 University of Wisconsin.

ROGERS, ELIZABETH ANN (1989) Assoc. Prof., Human Environments. BA 1963, MA 1973 University of Iowa.

ROGERS, JAMES R., II (1990) Senior Lecturer, Intensive English Language Institute. BA 1984 San Diego State University, MA 1990 Ohio University.

ROGERS, LINDA L. (1991) Adjunct Asst. Prof., Communication. BA 1974, MA 1979 University of Michigan.

ROGGMAN, LORI A. (1990) Assoc. Prof., Family and Human Development; Adjunct Assoc. Prof., Psychology. BS 1972, MS 1981 Utah State University, PhD 1988 University of Texas.

ROMESBURG, H. CHARLES (1972) Prof., Forest Resources; Consultant and Newsletter Editor, Computer Services. BS 1960 Lafayette College, MS 1962 University of Arizona, PhD 1972 University of Pittsburgh.

RONALD, NONIE B. (1985) Adjunct Clinical Instr., Nutrition and Food Sciences. BS 1979, MS 1981 University of Utah.

RONDEAU, VICTORIA L. (1995) Asst. Prof., Aerospace Studies. BSEE 1982 University of Texas, MSM 1990 Florida Institute of Technology.

ROOSTA, MEHRDAD (1986) Research Engineer, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1981 Utah State University.

ROPER, ROBERT G. (1988) Adjunct Prof., Physics. BS 1957, PhD 1963 University of Adelaide (Australia).

ROSEN, STEVEN W. (1989) Director and Chief Curator, Nora Eccles Harrison Museum of Art. BS 1964 University of Utah, MA 1970 State University of New York (Binghamton).

ROSENBAND, LEONARD N. (1983) Assoc. Prof., History. BA 1974 Bucknell University, MA 1976, PhD 1980 Princeton University.

ROSENTHAL, CAROL A. (1991) Life Skills Coordinator, Learning and Life Skills Center. BA 1991 Iowa State University.

ROSKELLEY, DAN W. (1979) Head Golf Coach, Intercollegiate Athletics. BA 1972 Utah State University.

ROSKELLEY, MARY LU (1989) Development and Public Relations Specialist, College of Natural Resources. BA 1985 Utah State University.

ROSS, JO ANN M. (1972) Asst. Prof. and Davis County Agent (Home Economics), University Extension. BS 1968 Utah State University, MS 1972 Colorado State University.

ROSSI, DELPHINE C. (1995) Lecturer, Health, Physical Education and Recreation. BS 1979 Western Connecticut State University, MS 1985 Southern Connecticut State University.

ROUSH, JAN E. (1983) Assoc. Prof., English. BA 1965 Ohio University, MA 1977, EdD 1985 East Texas State University.

ROWAN, LORI (1990) Research Instr., Communicative Disorders and Deaf Education. BT 1977 Brandon University, MEd 1990 Utah State University.

ROWLAND, CYNTHIA J. (1993) Clinical Instr., Center for Persons with Disabilities; Adjunct Clinical Instr., Special Education and Rehabilitation. BA 1980 University of California (Santa Barbara), MS 1984 Utah State University.

ROWLEY, ERIC (1996) Principal Lecturer, Mathematics and Statistics. BS 1985, MS 1991 Utah State University.

ROZUM, ELIZABETH (1995) Asst. Librarian, Library and Information Services, Learning Resources Program. BS 1988 San Francisco State University, MLS 1994 University of Michigan.

RUBEN, PETER CHARLES (1995) Assoc. Prof., Biology. BS 1975, MS 1977 George Washington University, PhD 1981 University of Calgary.

RUDIO, JACK L. (1992) Specialist, Center for Persons with Disabilities. AB 1962 University of Montana, MS 1964, EdD 1970 University of Illinois.

RULE, SARAH (1982) Prof., Special Education and Rehabilitation; Director, Outreach Project, Center for Persons with Disabilities; Adjunct Prof., Family and Human Development. BA 1967 The Colorado College, MA 1968 University of Pennsylvania, PhD 1972 University of Kansas.

RUPP, LARRY A. (1984) Assoc. Prof., Plants, Soils, and Biometeorology; Ext. Specialist (Ornamentals), University Extension. BS 1978, MS 1980 Utah State University, PhD 1984 Cornell University.

RUSMORE, BARBARA (1991) Administrative Assistant, College of Natural Resources. BA 1972 University of California (Santa Cruz), MEd 1990 University of Massachusetts (Amherst).

RUTLEDGE, BETTY J. (1976) Supervisor, Supply Department, Bookstore, Auxiliary Enterprises.

SAGERS, LARRY A. (1981) Ext. Assoc. Prof. and Salt Lake County Agent (Agriculture), University Extension. BS 1973 Brigham Young University, MS 1976 Utah State University.

SAILOR, PERRY J. (1994) Information Systems Specialist, Center for Persons with Disabilities. BA 1978 Washington University (St. Louis), MS 1991 Utah State University.

SAINSBURY, CAROL (1990) Adviser, Student Support Services, Student Services. BA 1981 Brigham Young University.

SALAS, JOE DANIEL (1994) Specialist, Center for Persons with Disabilities. BS 1974 Draughn's Business College, BA 1975 Colorado Technical Institute.

SALETNIK, DONALD P. (1987) Research Technologist, Stewart Radiance Laboratory, Space Dynamics Laboratory, USU Research Foundation.

SALISBURY, FRANK B. (1966) Prof., Plants, Soils, and Biometeorology. BS 1951, MA 1952 University of Utah, PhD 1955 California Institute of Technology.

SALZBERG, CHARLES L. (1982) Dept. Head and Prof., Special Education and Rehabilitation; Director, Social Competence Research; Prof., Psychology. BA 1965, MA 1967 Florida State University, PhD 1972 University of Kansas.

SANSOM, HILDA (1975) Data Preparation Supervisor, Computer Services.

SANTIBRATA, GOSH (1993) Research Prof., Biological and Irrigation Engineering. BS 1946 Presidency College (Calcutta, India), MS 1948, PhD 1956 University College of Science (Calcutta, India).

SAPERSTON, BRUCE M. (1987) Dept. Head and Assoc. Prof., Music. BA 1970 North Texas State University, MEd 1976, PhD 1986 University of Texas (Austin).

SAPP, ODES WILLIAM, Jr. (1975) Manager, Fine Arts Center. BA 1960 Panhandle State University, MA 1968 Texas Christian University.

SARGENT, STEVEN D. (1986) Research Engineer, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1982 Utah State University.

SAUNDERS, KRISTINE SCHWAB (1985) Ext. Asst. Prof. and Cache County Agent (Home Economics), University Extension. BS 1972, MS 1976 Utah State University.

SAUNDERS, LAVELL E. (1978) Asst. Vice President for Student Services; Director, Division of Academic Support Services; Adjunct Assoc. Prof., Family and Human Development. BS 1962, MS 1964 Utah State University, PhD 1969 University of Minnesota.

SAUNDERS, WALTER L. (1966) Prof., Secondary Education. BA 1959 San Francisco State College, MS 1963, PhD 1968 Oregon State University.

SAVAGE, DARIN S. (1995) Asst. Librarian, Library and Information Services, Learning Resources Program. BA 1988, MLS 1995 University of Oklahoma.

SAVELLO, PAUL ALEXANDER (1987) Assoc. Prof., Nutrition and Food Sciences; International Programs Coordinator, College of Family Life. BS 1966 Bates College, MS 1979 Brigham Young University, PhD 1982 Utah State University.

SAVOIE, NORMAN RICHARD (1971) Assoc. Prof., Languages and Philosophy. BA 1964 St. Anselm's College, MA 1965 Middlebury College, DEF 1965 Universite de Paris, PhD 1971 Indiana University.

SCHAAF, RENATE (1990) Prof., Mathematics and Statistics. Arbitur 1970 Marianne-Weber-Schule, PhD 1981 University of Heidelberg (West Germany).

SCHAELLING, DIANE (1993) Teacher, Edith Bowen Laboratory School. BS 1965, MEd 1993 Utah State University.

SCHENKENBERG, THOMAS R. (1980) Adjunct Clinical Asst. Prof., Psychology. PhD 1970 University of Utah.

SCHILLER, LAUREN (1995) Asst. Prof., Art. BFA 1992 East Carolina University, MFA 1995 University of Wisconsin (Madison).

SCHMICKLER, WOLFGANG (1990) Adjunct Prof., Physics. MS 1972, PhD 1973 University of Bonn (Fed. Rep. Germany).

SCHMID, PETER F. (1991) Keeper of Prints and Photographs Specialist, Library and Information Services, Learning Resources Program. BA 1987 University of Utah.

SCHMIDT, JOHN C. "JACK" (1991) Asst. Prof., Geography and Earth Resources; Adjunct Asst. Prof., Geology. BA 1972 Bucknell University, MA 1974 University of California (Berkeley), PhD 1987 The Johns Hopkins University.

SCHMIDT, ROBERT H. (1991) Asst. Prof., Fisheries and Wildlife; Adjunct Asst. Prof., Landscape Architecture and Environmental Planning. BS 1976 Ohio State University, MS 1981 University of Nebraska, MS 1985, PhD 1986 University of California (Davis).

SCHOCKMEL, RICHARD BRIAN (1976) Assoc. Librarian, Librarian-Materials Selection, Library and Information Services, Learning Resources Program. BA 1973, MEd 1978 Utah State University.

SCHROEDER, THOMAS JOSEPH (1989) Senior Lecturer, Intensive English Language Institute. BS 1970 Tulane University, BS 1977 Utah State University.

SCHULTE, GREGORY (1991) Asst. Prof., Art. BFA 1987, MFA 1991 University of Wisconsin.

SCHUNK, ROBERT W. (1975) Director, Center for Atmospheric and Space Sciences; Prof., Physics. BS 1965 New York University, PhD 1970 Yale University.

SCHUPP, EUGENE W. (1992) Asst. Prof., Rangeland Resources. BA 1977, MA 1981 University of South Florida, PhD 1987 University of Iowa.

SCHUSTER, THOMAS A. (1990) Specialist, Edith Bowen Laboratory School. BAE 1978 Arizona State University.

SCHVANEVELDT, JAY D. (1966) Prof., Family and Human Development; Adjunct Prof., Human Environments. BS 1961 Utah State University, MS 1962, PhD 1964 Florida State University. Sabb. 1995-96 academic year.

SCHVANEVELDT, NOREEN B. (1980) Director, Medical Dietetics Program, Clinical Asst. Prof., Nutrition and Food Sciences. BS 1976, MS 1980 Utah State University.

SCOTT, JAMES CALVERT (1982) Prof., Business Information Systems and Education. BA 1969 Boise State University, MEd 1970, PhD 1973 Oregon State University. Sabb. 9-1-96 to 8-31-97.

SCOTT, PATRICIA N. (1989) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1973 University of Utah.

SCOTT, PAULA E. (1994) Ext. Asst. Prof. and Salt Lake County Agent, University Extension. BS 1986, MS 1993 Utah State University.

SCOUTEN, WILLIAM H. (1993) Director, Biotechnology Center, Utah Agricultural Experiment Station; Prof., Chemistry and Biochemistry; Adjunct Prof., Nutrition and Food Sciences. BA 1964 Houghton College, PhD 1969 University of Pittsburgh.

SCRUGGS, JENNIFER (1995) Asst. Coach—Women's Track, Intercollegiate Athletics. BS 1990 Utah State University.

SEARLE, LLOYDENE (1980) Head Softball Coach and Head Basketball Coach, Women's Intercollegiate Athletics. BS 1976 Utah State University.

SEDGWICK, KEITH HOWARD (1974) Director, Internal Audits. BS 1969 Utah State University, CPA 1972 State of Utah.

SEDIVY, WILLIAM J. (1995) Temp. Visiting Lecturer, Communication.

SEEFELDT, LANCE C. (1993) Asst. Prof., Chemistry and Biochemistry. BS 1983 University of Redlands, PhD 1989 University of California (Riverside).

SEELEY, SCHUYLER D. (1971) Prof., Plants, Soils, and Biometeorology. BS 1964 Brigham Young University, MS 1969 Utah State University, PhD 1971 Cornell University.

SEETHALER, TUYET (1981) Ext. Instr. and Refugee Programs Agent, University Extension. BA 1978 Utah State University.

SEIFERT, GAIL ADAMS (1981) Adjunct Instr., Nutrition and Food Sciences. BS 1968 University of Washington, MS 1976 University of Idaho.

SEITER, JOHN S. (1994) Asst. Prof., Languages and Philosophy. BA 1986, MA 1989 California State University (Fullerton), PhD 1993 University of Southern California (Los Angeles).

SELLERS, CHARLES H. (1995) Adjunct Assoc. Prof., Physics. BS 1982 College of William and Mary, PhD 1988 Northwestern University.

SELLERS, JOAN B. (1978) Ext. Asst. Prof. and Carbon County Agent, University Extension. BS 1965, MS 1971 Utah State University.

SENEVIRATNE, PRIANKA N. (1991) Assoc. Prof., Civil and Environmental Engineering. BSc 1979 Loughborough University of Technology (Loughborough, England), MSc 1980 University of London (England), PhD 1983 University of Calgary (Canada).

SENTI, THAD E. (1993) Computer Programmer, Utah Water Research Laboratory.

SERRA, DUFF K. (1991) Temp. Asst. Prof., Theatre Arts. BA 1977 University of Colorado, MFA 1986 Case Western Reserve University, PhD 1991 Texas Tech University.

SESSIONS, RANDY (1993) Ext. Instr. and Morgan County Agent, University Extension. BS 1975 Brigham Young University.

SHAPERO, JANET (1991) Asst. Prof., Art. BSA 1975 Rhode Island School of Design, MFA 1989, MA 1990 University of Wisconsin.

SHARIK, TERRY L. (1993) Dept. Head and Prof., Forest Resources. BSF 1964 West Virginia University, MF 1966, PhD 1970 University of Michigan.

SHARMA, RAGHUBIR PRASAD (1969) Adjunct Prof., Animal, Dairy and Veterinary Sciences. BVS 1959 University of Rajasthan, PhD 1968 University of Minnesota.

SHARP, STEVEN J. (1993) Assoc. Director, Financial Aid Office. BS 1980, MS 1982 Utah State University.

SHARPSTEEN, CATHERINE JEAN (1983) Adjunct Clinical Instr., Communicative Disorders and Deaf Education. BA 1972 Allegheny College, MS 1976 Teachers College, Columbia University.

SHAVER, JAMES P. (1962) Dean, School of Graduate Studies; Prof., Secondary Education. BA 1955 University of Washington, AMT 1957, EdD 1961 Harvard University.

SHAW, ALAN W. (1966) Prof., Electrical and Computer Engineering and Center for Atmospheric and Space Sciences. BS 1955 Utah State University, MS 1956, PhD 1960 Stanford University.

SHAW, MELANIE (1992) Cataloger, Library and Information Services, Learning Resources Program. BS 1986 Utah State University, ML 1992 Graduate School of Library and Information Science, University of Washington.

SHAY, THOMAS M. (1982) Adjunct Assoc. Prof., Electrical and Computer Engineering. BA 1973 University of Connecticut, MS 1976, PhD 1978 Colorado State University.

SHEA, NANCY HUFFMAN (1994) Adjunct Asst. Prof., Forest Resources. BS 1975 Northern Arizona University, MA 1979 Southern Connecticut State University, MA 1987, PhD 1991 University of Massachusetts.

SHELBY, GEORGE S. (1982) Manager of Administrative Systems, Computer Services.

SHENTON, H. TOD (1994) Adjunct Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1990, PhD 1995 Utah State University.

SHEPERD, BRENNEN FORREST (1995) Research Associate, Geography and Earth Resources. BS 1992 State University of New York (Syracuse), MS 1994 Purdue University.

SHERLOCK, RICHARD (1985) Prof., Languages and Philosophy. BA 1970 University of Utah, MTS 1972 Harvard Divinity School, PhD 1978 Harvard University.

SHERRY, HALLIE PHILLIPS "LEE" (1985) Ext. Asst. Prof. and Tooele County Agent, University Extension. BSE 1971 University of South Dakota, MS 1980 University of Nebraska (Lincoln).

SHETTY, Y. KRISHNA (1967) Prof., Management and Human Resources. BA 1959 University of Bombay, MBA 1965, PhD 1967 University of California (Los Angeles).

SHIFRER, ANNE (1987) Assoc. Prof., English. BA 1974, MA 1977, PhD 1987 University of Utah. Sabb. 1995-96 academic year.

SHILLINGTON, AUDREY M. (1994) Asst. Prof., Sociology, Social Work and Anthropology. BA 1982 Drury College, MSW 1987, PhD 1991 Washington University (St. Louis), MPE 1993 Washington University School of Medicine.

SHINKLE, ANDREW G. (1994) Ext. Instr., Class Division, Continuing Education. BS 1991, MS 1993 Utah State University.

SHIPKA, MILAN (1991) Manager, Caine Dairy Farm; Research Instr., Animal, Dairy and Veterinary Sciences. BS 1983 University of Minnesota, MS 1990 Iowa State University.

SHOEMAKER, JAMES (1994) Research Engineer, Utah Water Research Laboratory. BS 1983 Texas A&M University, MS 1994 Utah State University.

SHOOK, RONALD R. (1983) Assoc. Prof., English. BA 1964, MA 1971 Brigham Young University, PhD 1981 Indiana University of Pennsylvania.

SHOTWELL, KAREN M. (1989) Research Associate, Biology. BS 1981 University of Idaho, MS 1986 University of California (Davis).

SHULTZ, LEILA M. (1973) Research Assoc. Prof., Forest Resources; Adjunct Assoc. Prof., Biology. BS 1969 University of Tulsa, MA 1975 University of Colorado, PhD 1982 Claremont Graduate School.

SHUMAN, FRANKLIN D. (1992) Temp. Instr., School of Accountancy. BS 1987, MAcc 1989 Utah State University.

SHYNKARUK, WILMER J. (1991) Ceramics Studio Coordinator, Art. BFA 1988 University of Manitoba, MA 1990, MFA 1991 University of Iowa.

SIDLE, ROY C. (1986) Adjunct Prof., Forest Resources, Civil and Environmental Engineering. BS 1970, MS 1972 University of Arizona, PhD 1976 Pennsylvania State University.

SIDWELL, DAVID E. (1993) Asst. Prof., Theatre Arts. BA 1988, MA 1990 Utah State University.

SIDWELL, ROBERT W. (1977) Prof., Animal, Dairy and Veterinary Sciences; Acting Assoc. Director, Utah Agricultural Experiment Station; Chairman, Biohazards Committee. BS 1958 Brigham Young University, MS 1961, PhD 1963 University of Utah.

SIEBERS, LAWRENCE H. (1993) Senior Lecturer, Management and Human Resources. BS 1955, MS 1958 University of Utah, PhD 1961 Illinois Institute of Technology (Chicago).

SILER, DALE GORDON (1979) Adjunct Asst. Prof., School of Accountancy. BS 1971, MBA 1972 Utah State University, MS, JD 1975 Golden Gate University.

SIMMONDS, JEANNIE F. (1990) Business Manager, Learning Resources Program; Manager, Publication Design and Production. BA 1974 Northern Illinois University.

SIMMONS, RANDY T. (1980) Dept. Head and Prof., Political Science; Director, Institute of Political Economy. BA 1975 Utah State University, MA 1978, PhD 1980 University of Oregon.

SIMMS, STEVEN R. (1988) Assoc. Prof., Sociology, Social Work and Anthropology. BA 1973 University of Utah, MA 1976 University of Nevada (Reno), PhD 1984 University of Utah.

SIMON, BENJAMIN (1989) Adjunct Assoc. Prof., Music. BA 1977 Yale College, MM 1979 Julliard School of Music.

SIMPER, CRAIG J. (1995) University Counsel, President's Office. BS 1975 Utah State University, JD 1977 University of Puget Sound (now Seattle University School of Law).

SIMS, JUDITH LARABEE (1986) Research Asst. Prof., Utah Water Research Laboratory and Civil and Environmental Engineering. BS 1971 University of Illinois (Urbana), MS 1973 University of North Carolina, MS 1981 North Carolina State University.

SIMS, RONALD C. (1981) Prof., Civil and Environmental Engineering and Utah Water Research Laboratory. BS 1970 University of Dayton, Ohio, MS 1977 Washington State University, PhD 1981 North Carolina State University.

SINCLAIR, BENJAMIN K. (1995) Development Director, College of Natural Resources. BS 1975 Utah State University, MS 1986 University of Massachusetts (Amherst).

SINCLAIR, SARA VORIS (1991) Adjunct Lecturer, Health, Physical Education and Recreation. BSN 1965 University of California (Los Angeles).

SIPORIN, ONA W. (1986) Asst. Editor, *Western Historical Quarterly*; Adjunct Instr., History. BA 1984 Boise State University.

SIPORIN, STEVEN (1986) Assoc. Prof., History and English. BA 1969 Stanford University, MA 1974 University of Oregon, PhD 1982 Indiana University.

SISSON, DONALD V. (1959) Prof., Mathematics and Statistics, Utah Agricultural Experiment Station. BA 1956 Gustavus Adolphus College, MS 1958, PhD 1962 Iowa State University.

SKOGERBOE, GAYLORD V. (1984) Prof., Biological and Irrigation Engineering. BS 1958, MS 1959 University of Utah.

SKOUSEN, CLIFFORD RICHARD (1978) Dept. Head and Ernst & Young Prof., School of Accountancy. BS 1970 Brigham Young University, MBA 1974 Pepperdine University, PhD 1979 Golden Gate University, CPA 1973 State of Hawaii, CPA 1979 State of Utah, CMA 1977 Institute of Management Accounting.

SLADE, BONNIE (1980) Lecturer, Music. BS 1963 Brigham Young University.

SLADE, JEFFREY H. (1990) Research Assistant and Farm Foreman, Utah Agricultural Experiment Station. BS 1989 Utah State University.

SLADE, LARRY MALCOM (1978) Assoc. Prof., Animal, Dairy and Veterinary Sciences. BS 1963 Brigham Young University, MS 1965 Virginia Polytechnic, PhD 1971 University of California (Davis).

SLADE, LYNNE M. (1995) Adviser, Science/HASS Advising Center. BS 1995 Utah State University.

SLEIGHT, WELDON SEYMOUR (1975) Assoc. Dean, Continuing Education; Prof., Agricultural Systems Technology and Education. BS 1972, MS 1975 Utah State University, PhD 1978 Iowa State University.

SLOCUM, TIMOTHY A. (1991) Asst. Prof., Special Education and Rehabilitation. BA 1982 University of California (Santa Cruz), MEd 1987, PhD 1991 University of Washington.

SMART, JERRY (1994) Producer/Director, Instructional Television, Multimedia and Distance Learning Services. BS 1993 Utah State University.

SMART, JULIE F. (1992) Asst. Prof., Special Education and Rehabilitation. BA 1968, MA 1970 University of Utah, PhD 1988 University of Northern Colorado.

SMART, ROSS A. (1967) Prof., Animal, Dairy and Veterinary Sciences. BS 1950 University of Idaho, DVM 1957 Colorado State University.

SMEE, DONALD F. (1989) Research Assoc. Prof., Animal, Dairy and Veterinary Sciences. BA 1974 University of Utah, MS 1979, PhD 1981 Utah State University.

SMELAND, CHRISTIAN O. (1995) Asst. Football Coach, Intercollegiate Athletics. BS 1974 California Polytechnic University, MBA 1976 University of Colorado.

SMELLIE, DON CARL (1966) Dept. Head and Prof., Instructional Technology. BS 1960 Brigham Young University, MS 1961, EdD 1967 Indiana University.

SMITH, ALFRED N., Jr. (1969) Prof., Languages and Philosophy. BA 1959 University of Denver, PhD 1968 Ohio State University.

SMITH, ARTHUR Y. (1968) Assoc. Prof., Theatre Arts. BS 1965, MS 1968 University of Utah, EdD 1977 Brigham Young University.

SMITH, BETH H. (1989) Asst. Budget Officer, Utah Agricultural Experiment Station. BS 1973 Utah State University.

SMITH, CLIFFORD JACK (1993) Chief Engineer, KUSU-FM (Utah Public Radio). BS 1988 Utah State University.

SMITH, DALE P. (1987) Publication Specialist/Buyer and Head—Printing and Operations, Publication Design and Production.

SMITH, DANIEL P. (1994) Asst. Prof., Civil and Environmental Engineering. BS 1976 State University of New York (Buffalo), MS 1981 Tulane University, PhD 1987 Stanford University.

SMITH, DIANA J. (1995) Employee Assistance Specialist, Personnel Services.

SMITH, EDWIN L. (1987) Adjunct Asst. Prof., Civil and Environmental Engineering. BS 1966 University of Utah.

SMITH, EUGENE R. (1993) Supervisor—Departmental Services, Instructional Technology. BS 1990 Brigham Young University (Hawaii).

SMITH, G. CARLOS (1992) Director, Alumni Relations. BS 1957 Utah State University.

SMITH, GEOFFREY G. (1993) Program Specialist, Utah Water Research Laboratory. BS 1979 Utah State University.

SMITH, JOHN A. (1988) Assoc. Prof., Elementary Education. BS 1975 Brigham Young University, MA 1980 University of Utah, PhD 1987 University of North Carolina (Chapel Hill).

SMITH, JOHN L. (1995) Head Football Coach, Intercollegiate Athletics. BS 1972 Weber State College, MS 1975 University of Montana.

SMITH, LARRY GENE (1965) Prof., Music. BS 1959, MM 1966 Utah State University, PhD 1978 University of Utah.

SMITH, LINDA N. (1992) Specialist, Center for Persons with Disabilities. BA 1976 Utah State University.

SMITH, LINDA Z. (1989) Program Specialist, Economics. BA 1966 Utah State University.

SMITH, MICHELLE M. (1991) Library Systems Manager, Information Systems, Learning Resources Program. BS 1990, MS 1991 Utah State University.

SMITH, NATHAN M., Jr. (1992) Assoc. Director, Educational Resources and Technology Center, College of Education; Adjunct Instr., Instructional Technology. BS 1980 Brigham Young University, MS 1991 Utah State University.

SMITH, TRUDY R. (1991) Life Skills Coordinator, Student Services. BS 1990 Utah State University.

SMITH-MORSE, LINDA Z. (1989) Temp. Instr., English. BA 1966 Utah State University.

SMITTEN, JEFFREY (1990) Dept. Head and Prof., English. BA 1963, MA 1966 University of California (Berkeley), PhD 1972 University of Wisconsin.

SNODEN, BARBARA A. (1993) Asst. Prof., Industrial Technology and Education. BS 1973 Oregon State University, JD 1977 Southwestern School of Law.

SNOW, KIMBERLY H. (1995) Clinical Instr., Special Education and Rehabilitation. BS 1988, MEd 1995 Utah State University.

SNOWBALL, KENTON R. (1993) Temp. Lecturer, Art. BS 1993 Utah State University.

SNOWDER, GARY D. (1992) Adjunct Research Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1977 University of California (Davis), MS 1980, PhD 1987 Texas A&M University.

SNYDER, DONALD L. (1981) Dept. Head and Prof., Economics; Marketing Specialist, University Extension. BS 1972, MS 1973 University of Wyoming, PhD 1979 Utah State University.

SNYDER-GANTZ, KATHRYN (1989) Adjunct Clinical Instr., Communicative Disorders and Deaf Education. BS 1981 State University of New York, MEd 1984 University of Virginia.

SOJKA, JAN JOSEF (1980) Asst. Director, Center for Atmospheric and Space Sciences; Prof., Physics. BS 1972 University of Edinburgh, PhD 1976 University of London.

SOPER, JOHN A. (1987) Ext. Asst. Prof. and Garfield and Kane County Agent (Agriculture), University Extension. BS 1958 Utah State University, MS 1972 University of Utah.

SORENSEN, DARWIN LEVOY (1975) Research Assoc. Prof., Utah Water Research Laboratory, Biology, and Civil and Environmental Engineering. BS 1972, MS 1975 Utah State University, PhD 1982 Colorado State University.

SÖRENSEN, SILVIA (1995) Asst. Prof., Family and Human Development. BA 1984 Antioch University, MS 1988 Technical University of Berlin, PhD 1993 Pennsylvania State University.

SORENSON, ANN W. (1992) Dept. Head and Prof., Nutrition and Food Sciences. BS 1958, MS 1970 University of Utah, PhD 1974 Utah State University.

SORENSON, DOXIE (1993) Catalog Specialist, Library and Information Services, Learning Resources Program. BA 1993 Utah State University.

SORENSON, ROBERT E. (1978) Dept. Head and Prof., Health, Physical Education and Recreation. BS 1967, MHEd 1969 Brigham Young University, PhD 1972 Southern Illinois University (Carbondale).

SORENSON, TRACY DENNIS (1995) Program Administrator, Center for Persons with Disabilities. BS 1994 Utah State University.

SOULIER, J. STEVEN (1975) Assistant to the Dean for Technology, College of Education; Assoc. Prof., Instructional Technology. BS 1969 University of Utah, MEd 1970 Utah State University, EdD 1975 Indiana University.

SPACKMAN, MARILYN (1990) Supervisor, Custodial Services, Physical Plant.

SPACKMAN, R. JILL (1992) Specialist, Center for Persons with Disabilities. BFA 1992 Utah State University.

SPARKS, GEORGE E. (1986) Instr., Music. BME 1973 Henderson State University, MM 1976 University of Michigan.

SPAULDING, APRIL J. (1995) Director, Multicultural Student Affairs. BS 1990 Oregon State University (Corvallis).

SPENCER, JOHN RUSSELL (1989) Program Specialist, Class Division, Continuing Education. BA 1983 Brigham Young University, MS 1989 Utah State University.

SPENDLOVE, REX S. (1966) Adjunct Prof., Biology and Animal, Dairy and Veterinary Sciences. BS 1950, MS 1952 Brigham Young University, PhD 1955 Ohio State University.

SPIELMAKER, DEBRA M. (1994) Project Coordinator for Agriculture in the Classroom, Youth Programs, University Extension. BS 1984, MS 1985 Utah State University.

SPOONER, MICHAEL (1993) Director, USU Press and Scholarly Publications. BS 1976 Grace College, MA 1979 Northern Arizona University.

SPRANGER, ANN (1995) Landscape Planner/Coordinator, Plants, Soils, and Biometeorology. BA 1986 Metropolitan State College (Denver), MLA 1993 Utah State University.

SPRIET, SHERYL Y. (1989) Clinical Instr., Communicative Disorders and Deaf Education. BS 1985, MS 1988 Utah State University.

SPYKERMAN, BRYAN RAY (1986) Adjunct Asst. Prof., Sociology, Social Work and Anthropology. BA 1968 University of Utah, MS 1978, PhD 1984 Utah State University.

SQUIRES, LORIN E. (1986) Ext. Asst. Prof., Uintah Basin Branch Campus, Continuing Education. BS 1971, MS 1974, PhD 1977 Brigham Young University.

STAFFORD, EDWIN R. (1993) Asst. Prof., Business Administration. BS 1987 San Jose State University, MBA 1989 Santa Clara University.

STAHL, CAROLYN S. (1995) Compliance and Training Manager, Environmental Health and Safety. BS 1990 Ohio University.

STAHL, RANDALL (1995) Postdoctoral Fellow, Plants, Soils, and Biometeorology. BS 1984 University of Tennessee. MS 1986 Texas A&M University, PhD 1990 University of Maryland.

STAIR, ALVA T. (1987) Research Prof., Physics and Stewart Radiance Laboratory, Space Dynamics Laboratory, USU Research Foundation. BS 1952, PhD 1956 University of Oklahoma.

STALTER, LINDA L. (1987) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1975 Brigham Young University.

STAPLEY, DARCI PETERSEN (1988) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1986 Utah State University.

STARK, JOHN M. (1991) Asst. Prof., Biology; Adjunct Asst. Prof., Plants, Soils, and Biometeorology. BS, BA 1981 Humboldt State University. MS 1983 Colorado State University (Fort Collins). PhD 1990 University of California (Berkeley).

STAUFFER, NORMAN E., Jr. (1987) Adjunct Prof., Civil and Environmental Engineering. BS 1960, PhD 1964 Utah State University.

STEARMAN, ROBERTA S. (1961) Asst. Prof., English. BS 1960, MA 1963 Utah State University.

STEED, ALLAN J. (1964) Division Manager, Systems Division, Space Dynamics Laboratory, USU Research Foundation; Prof., Electrical and Computer Engineering. BS 1963, MS 1965, PhD 1978 Utah State University.

STEENERSON, CRAIG A. (1993) Technical Support Specialist and Scene Shop Foreman/Technical Director, Theatre Arts. BA 1992 California State University (San Bernadino).

STEGELMEIER, BRYAN L. (1992) Adjunct Research Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1983 Utah State University. DVM 1987, PhD 1990 Purdue University.

STEGGELL, CARMEN (1994) Temp. Research Asst. Prof., Human Environments. BS 1984, MS 1988 Utah State University, PhD 1992 Oregon State University.

STEIN, DAVID MICHAEL (1988) Acting Head and Assoc. Prof., Psychology. BS 1975, PhD 1981 Brigham Young University.

STEIN, JANET SUSAN (1984) Personnel Specialist, Personnel Services. BS 1973 New York University.

STEINHOFF, GORDON R. (1988) Assoc. Prof., Languages and Philosophy. BS 1976, BA 1977 Utah State University, MSc 1980 University of British Columbia, MA 1985, PhD 1987 Indiana University.

STELLFLUG, JOHN N. (1995) Adjunct Research Assoc. Prof., Animal, Dairy and Veterinary Sciences. BS 1969, MS 1972 Montana State University, PhD 1976 Michigan State University.

STENQUIST, NORRIS J. (1958) Prof., Animal, Dairy and Veterinary Sciences; Bear River and Weber Area Livestock Specialist, University Extension. BS 1957, MS 1960 Utah State University, PhD 1968 Colorado State University.

STEPHENS, ALAN A. (1984) Assoc. Prof., Business Administration. BS 1973, MBA 1975, PhD 1980 University of Utah.

STEPHENS, DAVID B. (1985) Dean, College of Business; Prof., Management and Human Resources. BA 1968 Brigham Young University, MBA 1969 University of Pittsburgh, PhD 1975 University of Texas.

STEPHENS, DOYLE W. (1989) Adjunct Prof., Civil and Environmental Engineering. BS 1967 Weber State College, MS 1969, PhD 1974 University of Utah.

STERLING, NATALIE H. (1993) Asst. Director, Disability Resource Center. BS 1993 Utah State University.

STEVENS, DAVID K. (1986) Assoc. Prof., Utah Water Research Laboratory, Civil and Environmental Engineering. BSCE 1976 Tufts University, PhD 1982 University of Wisconsin (Madison).

STEVENS, JAMES W. (1975) Ext. Assoc. Prof., Animal, Dairy and Veterinary Sciences; Ext. Asst. Prof. and County Agent (Salt Lake), University Extension. BS 1967, MS 1972 Utah State University.

STEVENS, T. CLAY (1995) Research Associate, Instructional Technology. BS 1988 Brigham Young University, MS 1993 Boise State University.

STEVENSON, ALAN C. (1983) Adjunct Clinical Instr., Communicative Disorders and Deaf Education. BA 1970 University of Minnesota, MA 1976 Teachers College, Columbia University.

STEWARDSON, GARY A. (1989) Assoc. Prof., Industrial Technology and Education. BS 1976 Illinois State University, MS 1980 Eastern Illinois State University, PhD 1987 University of Maryland.

STILES, GARDINER STUART (1976) Prof., Electrical and Computer Engineering. BA 1966 University of Washington, MS 1971, PhD 1974 Stanford University.

STINNER, WILLIAM F. (1975) Prof., Sociology, Social Work and Anthropology; Research Associate, Population Research Laboratory. AB 1960 Columbia University, MA 1966, PhD 1969 Pennsylvania State University.

STIRLING, WYNN C. (1991) Adjunct Assoc. Prof., Electrical and Computer Engineering. BA 1969, MS 1971 University of Utah, PhD 1983 Stanford University.

STOCK, JANET CLARK (1974) Assoc. Prof., Languages and Philosophy. BS 1959, MS 1961, BA 1968 Utah State University, MA 1972, PhD 1982 University of Utah.

STOCK, JAMES (1995) Temp. Lecturer, Industrial Technology and Education. BS 1991 Southern Utah University, MS 1995 Utah State University.

STOCK, REED C. (1959) Prof., English. BS 1954 Utah State University, MA 1958, PhD 1968 Rutgers University. Sabb. 1995-96 academic year.

STOCKER, H. ROBERT (1971) Prof., Business Information Systems and Education. BS 1967, MS 1968 Utah State University, PhD 1975 University of Iowa.

STOCKER, MONEICE (1993) Adviser, College of Business. BS 1971, MS 1973 Utah State University.

STODDARD, CHARLES GRANT (1987) Manager of Dept. Services and Research Asst. Prof., Instructional Technology. BS 1977, MEd 1978 Utah State University.

STODDART, PATRICIA T. (1995) Lecturer, Secondary Education and English. BS 1962, MA 1987 Utah State University.

STOGNER, HORACE N., Jr. (1990) Adviser, Science/HASS Advising Center. BA 1974 Brigham Young University.

STOKER, LYNN J. (1972) Auxiliaries and Services Finance Manager, Controllers Office. BS 1964 Utah State University.

STONE, DANIEL A. (1994) Adjunct Prof., Civil and Environmental Engineering. BS 1966, BS 1971 Utah State University, PhD 1975 University of Colorado (Boulder).

STONE, EMILY (1993) Asst. Prof., Mathematics and Statistics. BA 1984 University of California (Santa Cruz), PhD 1989 Cornell University.

STOWELL, LINDA A. (1994) Adjunct Instr., Human Environments. BA 1991 Utah State University.

STRAND, BRADFORD N. (1989) Assoc. Prof., Health, Physical Education and Recreation. BS 1978 Mayville State University, MS 1984 North Dakota State University, PhD 1988 University of New Mexico.

STRAQUADINE, GARY S. (1988) Dept. Head and Assoc. Prof., Agricultural Systems Technology and Education; Staff Development Leader, University Extension. BS 1979, MA 1985 New Mexico State University, PhD 1987 Ohio State University.

STRICKLAND, MARIE S. (1993) Research Associate, Nutrition and Food Sciences. BS 1965, MS 1968 University of Utah, PhD 1978 University of Cape Town (South Africa).

STRIEFEL, SEBASTIAN (1974) Director of Division of Services, Center for Persons with Disabilities; Prof., Psychology. BS 1964 South Dakota State University, MA 1966 University of South Dakota, PhD 1968 University of Kansas.

STRINGAM, BLAIR L. (1992) Research Engineer, Biological and Irrigation Engineering. BAE 1988 University of Alberta (Canada), MS 1992 Utah State University.

STRINGER, JOSEPH POST (1994) Adjunct Asst. Prof., Forest Resources. BS 1978 Utah State University, JD 1981 University of Arkansas School of Law (Fayetteville).

STRONG, CAROL J. (1973) Assoc. Prof., Communicative Disorders and Deaf Education. BS 1971 Utah State University, MA 1972 University of Illinois, EdD 1989 Utah State University.

STRONG, RICHARD W. (1971) University Engineer, Campus Planning and Engineering; Adjunct Asst. Prof., Electrical and Computer Engineering. BS 1954, BS 1961 University of Utah.

STRONG, WILLIAM (1968) Dept. Head and Prof., Secondary Education. BS 1962 Portland State College, MST 1965 University of Oregon, PhD 1973 University of Illinois.

STULL, WILLIAM A. (1974) Prof., Business Information Systems and Education. BS 1963 Miami University (Oxford), MS 1966 Michigan State University, EdD 1973 Virginia Polytechnic Institute.

SULLIVAN, KIMBERLY A. (1988) Assoc. Prof., Biology. BA 1979 University of Pennsylvania, PhD 1984 Rutgers University. Sabb. 1996-97 academic year.

SUMMERS, LYLE C. (1991) Adjunct Asst. Prof., Civil and Environmental Engineering.

SUNDERLAND, NORMAN R. (1991) Director, Environmental Health and Safety. BS 1960 University of Oklahoma, MS 1973 University of Nevada (Las Vegas), PhD 1985 Columbia-Pacific University.

SVEJDA, KATHLEEN M. (1983) Contract Specialist, Business Service Center, USU Research Foundation. BS 1976, MBA 1978 Utah State University.

SWAIN, CYNTHIA J. (1995) Physical Therapist, Center for Persons with Disabilities. BS 1984, BS 1986 University of Kansas.

SWAIN, GREG M. (1993) Asst. Prof., Chemistry and Biochemistry. BA 1985 University of Texas (Dallas), PhD 1991 University of Kansas.

SWANER, SHAWN (1995) Computer Specialist, Biology.

SWENSEN, ARLA (1994) Administrative Assistant, Continuing Education.

SWENSEN, DANA H. (1995) Lecturer, Business Information Systems and Education. BS 1991, MS 1995 Utah State University.

SWENSEN, PHILIP ROMNEY (1975) Dept. Head and Prof., Business Administration. BA 1968 Brigham Young University, MBA 1970, DBA 1972 Indiana University. Sabb. 1-1-96 to 9-30-96.

SWENSON, CHARLES M. (1991) Asst. Prof., Electrical and Computer Engineering. BS 1985, MS 1989 Utah State University, PhD 1991 Cornell University.

SWIDNICKI, SUSAN (1993) Teacher of Oboe, Music. BM 1987 University of Utah, MM 1990 St. Louis Conservatory of Music.

SWORD, KIM E. (1995) Asst. Coach, Training Room and Medical, Intercollegiate Athletics. BS 1993 Missouri Western University, MS 1995 Utah State University.

TADLOCK, MARTIN K. (1993) Asst. Prof., Elementary Education. BS 1981, MEd 1986 Utah State University, PhD 1990 Miami University (Ohio).

TAKEMOTO, JON Y. (1975) Prof., Biology. BA 1967, PhD 1973 University of California (Los Angeles).

TARBOTON, DAVID G. (1990) Asst. Prof., Utah Water Research Laboratory, Civil and Environmental Engineering. BS 1981 University of Natal (Durban, South Africa), MS 1987, ScD 1989 Massachusetts Institute of Technology.

TARNUTZER, SHARON (1990) Senior Lecturer, Management and Human Resources. BA 1966 California Western University, MBA 1986 Utah State University.

TATEYAMA, LAURA (1983) Adjunct Instr., Nutrition and Food Sciences. BS 1963 Oregon State University, MS 1976 Troy State University (European Division).

TATUM, KATHY (1993) Field Supervisor, Special Education and Rehabilitation. BA 1973 University of Missouri, MS 1983 University of Utah.

TAYLOR, GLENN N. (1986) Adjunct Research Prof., Animal, Dairy and Veterinary Sciences. BS 1950 University of Utah, MS 1955 Utah State University, DVM 1956 Colorado State University, PhD 1970 University of Utah.

TAYLOR, MATTHEW JAMES (1991) Research Associate, Center for Persons with Disabilities. BS 1983 Utah State University.

TAYLOR, MICHAEL J. (1992) Research Assoc. Prof., Physics. BS 1974, MS 1977, PhD 1986 Southampton University (England).

TEICHER, LUZ S. (1993) Adjunct Research Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1965 City College, City University of New York, MS 1971, PhD 1976 University of Rochester.

TEIGELER, TERRY R. (1982) Asst. Prof. (Ext.) and Asst. Director, Extension Class Division, Continuing Education; Director, Hill Air Force Base/Ogden Center. BS 1967 Weber State College, MS 1974 Brigham Young University, EdD 1976 University of Nebraska.

TENHOEVE, MARK (1987) Director, High School/College Relations. BS 1983 Utah State University.

TERRY, CHRISTOPHER T. (1988) Assoc. Prof., Art. BA 1978 Rhode Island College, MFA 1981 University of Wisconsin (Madison).

TERRY, WILLIAM (1985) Technical Support Specialist, Computer Services.

TEW, AFTON B. (1983) Director, Office of International Students and Scholars, Student Services.

THILMANY, DAWN D. (1994) Asst. Prof., Economics. BS 1990 Iowa State University, MS 1991, PhD 1994 University of California (Davis).

THIMMES, DIANA MAE (1985) Admissions Officer, School of Graduate Studies. BA 1969 Southern Utah State College.

THIMMES, MADELINE (1993) Adviser, Business Administration. BS 1981, MBA 1983 Utah State University.

THOM, DERRICK JAMES (1968) Prof. and Graduate Program Coordinator, Geography and Earth Resources; Asst. Dean for International Programs, College of Natural Resources. BA 1963, MA 1965 University of Utah, PhD 1970 Michigan State University. Sabb. 9-15-95 to 9-14-96.

THOMAS, H. PRESTON (1965) Prof., Political Science. BS 1954 Utah State University, JD 1957 Harvard University.

THOMAS, JAMES H. (1969) Prof., Plants, Soils, and Biometeorology; Director of International Programs, College of Agriculture. BS 1961, MS 1963 Utah State University, PhD 1966 University of Alberta.

THOMAS, MAURICE G. (1982) Dept. Head and Prof., Industrial Technology and Education; Director, Applied Technology Education Programs. BS 1962, MS 1965 Utah State University, PhD 1968 Texas A&M.

THOMPSON, DIANE (1985) Medical Technologist, Student Health Services. BS 1970 Utah State University.

THOMPSON, DONALD (1990) Research Scientist, Center for Atmospheric and Space Sciences. BS 1983 Weber State College, PhD 1989 Utah State University.

THOMPSON, LUCY ANN (1979) Asst. to Director, International Programs and Studies; Coordinator, USAID/FAO/USU Foreign Participant Training. BS 1977 Utah State University.

THOMPSON, PAUL D. (1995) Research Associate, Ecology Center. BS 1992 Eastern Illinois University, MS 1994 University of Wyoming.

THOMPSON, RONDA L. (1995) Program Administrator, Festival of the American West; Program Administrator, Man and His Bread Museum; Asst. Director, American West Heritage Foundation, University and Community Relations. BA 1992 Teikyo Marycrest University.

THOMPSON, RUSSELL C. (1977) Prof., Mathematics and Statistics. BA 1968, PhD 1973 University of Utah.

THOMSON, SHERMAN V. (1978) Prof., Biology; Plant Pathology Specialist, University Extension. BS 1967, MS 1969 Utah State University, PhD 1972 University of Arizona.

THORKILDSEN, RON J. (1972) Assoc. Dean for Research and Chairman, Bureau of Research Services, College of Education; Prof., Instructional Technology, Special Education and Rehabilitation. BS 1967, MBA 1972 Utah State University, PhD 1984 University of Oregon.

THORN, GARY R. (1988) Adjunct Lecturer, Biology. BS 1974 Loma Linda University School of Medical Technology.

THORNLEY, GLEN JAY (1977) Admin. Assistant, Chemistry and Biochemistry.

THORPE, J. DERLE (1965) Assoc. Prof., Civil and Environmental Engineering. BS 1959, MS 1965 Utah State University.

THUNELL, RANDALL K. (1991) Adjunct Asst. Prof., Nutrition and Food Sciences. BS 1974 Utah State University, BA 1977 Brigham Young University, MS 1977 Utah State University, PhD 1982 Oregon State University.

THURGOOD, RONALD L. (1969) Assoc. Dean, College of Engineering; Prof., Electrical and Computer Engineering; Supervisor, Digital Systems Laboratory. BS 1965, MS 1966 University of Utah, PhD 1969 Utah State University.

THURGOOD, V. ALAN (1979) Research Engineer, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1979 Utah State University.

THURSTON, STEPHANIE (1984) Lecturer, Human Environments. BA 1979 Michigan State University.

TILLER, WALLACE W. (1975) Program Associate, International Sheep and Goat Institute, Animal, Dairy and Veterinary Sciences.

TIMLIN, DENNIS (1987) Postdoctoral Fellow, College of Agriculture. BS 1974 State University of New York, MS 1985, PhD 1987 Cornell University.

TIMMONS, LESLIE (1977) Lecturer, Music. BM 1971, MM 1973 Michigan State University.

TIMMONS, MICHAEL LEE (1977) Assoc. Prof., Landscape Architecture and Environmental Planning. BLA 1970 Michigan State University, MLA 1973 Harvard University Graduate School of Design.

TINGEY, JENNIFER W. (1987) Assoc. Director, Science and HASS Advising Center.

TINNEY, CHARLES E. (1988) Asst. Prof., Industrial Technology and Education; Adjunct Asst. Prof., Physics. BS 1967, MS 1968 Brigham Young University, PhD 1974 University of Utah.

TITCHENER, FRANCES BONNER (1987) Assoc. Prof., History, Languages and Philosophy. BA 1979 University of Houston, MA 1981, PhD 1988 University of Texas (Austin). Sabb. 1995-96 academic year.

TOBLER, SHAUN D. (1994) Program Administrator, Family and Human Development. BS 1994 Utah State University.

TOELKEN, BARRE (1985) Prof., English and History; Director, Folklore Program. BS 1958 Utah State University, PhD 1964 University of Oregon.

TOLINE, C. ANNA (1995) Asst. Prof., Fisheries and Wildlife. BS 1983, MS 1987 University of Illinois, PhD 1994 University of Toronto.

TONEY, MELINDA (1992) Temp. Lecturer, Elementary Education. BS 1975, MS 1981 Utah State University.

TONEY, MICHAEL B. (1973) Prof., Sociology, Social Work and Anthropology. BA 1969 Marshall University, MA 1971, PhD 1973 Brown University.

TOOLEY, EDGAR W. (1991) Administrator of Business Information Systems and Off-campus Computer Labs, Class Division and Independent Study Division, Continuing Education. BS 1990 Utah State University.

TOONE, THOMAS E. (1981) Asst. Prof., Art. BA 1974 Brigham Young University, MA 1979, PhD 1982 Pennsylvania State University.

TOPOVSKI, LYNN WALTER (1993) Asst. Prof., Health, Physical Education and Recreation. BFA 1975, MFA 1994 University of Utah.

TORCHIO, PHILIP FRANK (1994) Adjunct Asst. Prof., Biology. BS 1956 San Jose State College, MS 1963 Oregon State University.

TORELL, DAVE (1994) Visiting Adjunct Assoc. Prof., Rangeland Resources. BS 1977, MS 1979 University of Nevada (Reno).

TORRE, CHARLES GREGORY (1991) Asst. Prof., Physics. BS 1980 Duke University, PhD 1985 University of North Carolina.

TORRES, ANTHONY RONALD (1987) Research Assoc. Prof., Animal, Dairy and Veterinary Sciences; Adjunct Assoc. Prof., Biology. BS 1970, MD 1974 University of Utah.

TOTH, RICHARD E. (1972) Dept. Head and Prof., Landscape Architecture and Environmental Planning. BS 1961 Michigan State University, MLA 1963 Harvard University.

TOTSKI, HENRY A. (1983) Adjunct Clinical Prof., Biology. AB 1954 Central Methodist College, MD 1957 University of Missouri School of Medicine.

TOYER, CURT L. (1991) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BA 1977 Brigham Young University.

TRACY, DIANE M. (1988) Adjunct Asst. Prof., Health, Physical Education and Recreation. BS 1975 Brigham Young University, MS 1982 University of Utah, PhD 1985 University of Oregon.

TRUHN, PATRICIA L. (1989) Adjunct Asst. Prof., Psychology. BS 1966, MS 1971 Purdue University, PhD 1989 Ball State University.

TSCHANZ, JOANN T. (1994) Clinical Director—Cache County Study on Memory in Aging, College of Family Life; Research Asst. Prof., Family and Human Development; Adjunct Asst. Prof., Psychology. BS 1985 Idaho State University, PhD 1990 Indiana University.

TUELLER, BENNION LAMONT (1979) Ext. Asst. Prof. and Weber County Agent (Youth), University Extension. BS 1959, MS 1972 Utah State University.

TUELLER, REX L. (1970) Asst. Vice President Extension/Dean of Continuing Education, Continuing Education; Assoc. Prof., University Extension. BS 1961, EdD 1971 Utah State University.

TULLIS, J. PAUL (1977) Sr. Research Scientist, Technical Research Laboratory, Space Dynamics Laboratory, USU Research Foundation; Prof., Civil and Environmental Engineering. BS 1961, PhD 1966 Utah State University.

TURCOTTE, STEPHEN B. (1992) Research Asst. Prof., Electrical and Computer Engineering. BS 1982 Cornell University, ME 1989, PhD 1992 University of Utah.

TURLEY, SUSAN D. (1995) Specialist, Center for Persons with Disabilities. RN 1981 University of Alberta.

TURNER, KATHRYN (1987) Assoc. Prof., Mathematics and Statistics. BA 1973 University of Texas (Austin), MS 1977 University of Houston, MA 1984, PhD 1987 Rice University.

UDY, KENT J. (1987) Supervisor—Laboratory Animal Research Center, Vice President for Research Office.

ULWICK, JAMES C. (1980) Research Prof., Electrical and Computer Engineering; Director, Science Division, Space Dynamics Laboratory, USU Research Foundation. BA 1950, MS 1951 Tufts University.

UNDERWOOD, ERNEST EUGENE (1961) Assoc. Prof., Mathematics and Statistics. BA 1957 University of Montana, MA 1961 University of Illinois.

URROZ, GILBERTO E. (1988) Assoc. Prof., Civil and Environmental Engineering and Utah Water Research Laboratory. BS 1980 Universidad Nacional Autonoma de Nicaragua, MS 1982, PhD 1988 University of Iowa.

UTLEY, ROBERT M. (1993) Adjunct Prof., History. BS 1951 Purdue University, MA 1952 Indiana University.

UYEMATSU, JENNIFER (1995) Adjunct Clinical Instr., Communicative Disorders and Deaf Education. BS 1991, MS 1993 Utah State University.

VALERO, ARTHUR M. (1995) Asst. Football Coach, Intercollegiate Athletics. BS 1981 Boise State University, MA 1984 Iowa State University.

VAN DUSEN, LANI MARIE (1989) Assoc. Prof., Psychology. BS 1982, MS 1985, PhD 1988 University of Georgia.

VAN MIEGROET, HELGA (1993) Asst. Prof., Forest Resources; Adjunct Asst. Prof., Plants, Soils, and Biometeorology. BS 1978 State University of Ghent (Belgium), MS 1980, PhD 1986 University of Washington (Seattle).

VAN NIEL, THOMAS G. (1995) Specialist, Forest Resources. BS 1992, MS 1995 Utah State University.

VAN SUCHTELEN, ADRIAN (1965) Prof., Art. Diploma El Camino Jr. College, BFA, MFA 1966 Otis Art Institute of Los Angeles.

VANDIVER, ELIZABETH (1995) Visiting Asst. Prof., History. BA 1976 Shimer College, MA 1984, PhD 1990 University of Texas (Austin).

VARGA, WILLIAM ANTHONY (1974) Research Associate, Ext. Specialist (Ornamental Horticulture), and Director of Botanical Gardens, Plants, Soils, and Biometeorology; Director, Utah Botanical Gardens. BS 1972, MS 1974 Utah State University.

VAUGHAN, DANA K. (1992) Asst. Prof., Biology. BA 1980, PhD 1988 University of California (Santa Barbara).

VELARDE, TERESA (1989) Asst. Director for Student Activities, Student Services. BS 1987 Our Lady of the Lake University.

VENDELL, EDWARD W., Jr. (1960) Prof., Mechanical and Aerospace Engineering and Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1955, MS 1960 University of Utah, PhD 1967 Oklahoma State University.

VEST, H. GRANT, Jr. (1989) Prof., Plants, Soils, and Biometeorology; Assoc. Director, Utah Agricultural Experiment Station. BS 1960, MS 1964 Utah State University, PhD 1967 University of Minnesota.

VIEHWEG, STEVEN HERMAN (1967) Prof., Communicative Disorders and Deaf Education. BS 1963, MS 1965 Utah State University, PhD 1968 Northwestern University.

VIEIRA, DAVID J. (1993) Adjunct Assoc. Prof., Physics. BS 1972 Oregon State University, PhD 1978 University of California (Berkeley).

VINSONHALER, JEANE C. (1993) Director of Planning and Analysis, President's Office. BA 1958 University of California (Berkeley), PhD 1986 Michigan State University.

VINSONHALER, JOHN F. (1996) Prof., Business Information Systems and Education. BA 1958, PhD 1964 University of California (Berkeley).

VITALE, TAMARA S. (1995) Temp. Lecturer, Nutrition and Food Sciences. BS 1989 Utah State University.

WAGNER, FREDERIC H. (1961) Assoc. Dean, College of Natural Resources; Director, Ecology Center; Prof., Fisheries and Wildlife. BS 1949 Southern Methodist University, MS 1953, PhD 1961 University of Wisconsin.

WAGNER, MAUREEN (1992) Academic Services Adviser, College of Natural Resources. BS 1987 University of Idaho.

WAGSTAFF, BETSY (1990) Teacher, Edith Bowen Laboratory School. BS 1972 Weber State College.

WALDEN, BETH (1989) Research Assistant, SKI*HI Institute, Communicative Disorders and Deaf Education. BA 1982 University of Colorado.

WALK, FREDERICK DAVID, Jr. (1970) Admin. Assistant, Ecology Center. BS 1948 University of Utah.

WALKER, BARBARA W. (1981) Asst. Director, Folklore Program. BS 1973, MA 1986 Utah State University.

WALKER, ELIZABETH (1993) Writer/Editor, Information News Services. BA 1974 Nazareth College of Rochester, MA 1980 University of New Mexico.

WALKER, HOMER F. (1985) Prof., Mathematics and Statistics. BA 1966 Rice University, MS 1968, PhD 1970 New York University.

WALKER, JOHN W. (1993) Adjunct Asst. Prof., Rangeland Resources. BS 1976 Texas A&M University, MS 1981 Colorado State University, PhD 1988 Texas A&M University.

WALKER, JULIE A. (1995) Postdoctoral Fellow, Animal, Dairy and Veterinary Sciences. BS 1983 North Dakota State University, MS 1990 Purdue University, PhD 1995 University of Kentucky.

WALKER, WYNN R. (1980) Dept. Head and Prof., Biological and Irrigation Engineering; International Programs Coordinator, College of Engineering. BS 1969 Utah State University, MS 1970, PhD 1973 Colorado State University.

WALLENTINE, RHEA H. (1995) Admissions Counselor, Enrollment Services. BS 1969 Utah State University.

WALSH, MARIE K. (1994) Asst. Prof., Nutrition and Food Sciences. BS 1988, MS 1989 Utah State University, PhD 1993 North Carolina State University.

WALTERS, CHERYL D. (1995) Cataloging Specialist, Library and Information Services, Learning Resources Program. BA 1980, MLS 1987 University of South Florida.

WALTERS, JEFFREY L. (1975) Research Asst. Prof. and Graduate Program Coordinator, Animal, Dairy and Veterinary Sciences. BS 1966, MS 1969 Rutgers University, PhD 1975 Ohio State University.

WALTERS, JOHN S. (1995) Asst. Librarian, Library and Information Services, Learning Resources Program. BS 1975 Central Michigan University, MLS 1982 Western Michigan University, MA 1983 Central Michigan University.

WAMSLEY, JAY CLAYTON (1982) Director, Student Publications, Student Activities, Student Services and Information Services. BS 1976, MS 1988 Utah State University.

WANG, RICHARD R.-C. (1983) Adjunct Assoc. Prof., Biology. BS 1967 National Taiwan University, MS 1971, PhD 1974 Rutgers University.

WANG, SHIQUAN (1988) Research Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1968 University of Sichuan (China), MS 1981 University of Science and Technology of China, PhD 1988 Utah State University.

WANG, ZHI QIANG (1991) Assoc. Prof. and Director of Graduate Studies, Mathematics and Statistics. BS 1982 Jilin University (China), MS 1986, PhD 1986 Institute of Mathematics (Beijing).

WARD, BEN III CPT (1991) Asst. Prof., Military Science. BS 1984 University of South Carolina.

WARD, VERONICA (1982) Assoc. Prof., Political Science. BA 1976 Northeastern University, MA 1981, PhD 1985 University of Maryland.

WARE, GENE A. (1972) Adjunct Assoc. Prof., Electrical and Computer Engineering; Supervisor, Data Systems Laboratory. BS 1964, MS 1966 Brigham Young University, PhD 1980 Utah State University.

WARMA, SUSANNE JULIANE (1988) Assoc. Prof., Art. BA 1973 Columbus College, MA 1981, PhD 1988 University of Georgia. Sabb. 9-11-95 to 6-8-96.

WARNER, DARRELL N. (1990) Research Associate, Nutrition and Food Sciences. BS 1963, MS 1968 Utah State University, BS 1978 Weber State College.

WARNICK, VAL DEE (1976) Ext. Asst. Prof. and Wasatch County Agent, University Extension. BS 1974 Utah State University, MS 1976 Utah State University.

WARREN, MARY ANN (1987) Adviser for Undergraduate Programs, Elementary Education. BS 1965 University of Utah.

WARREN, REED PARLEY (1982) Prof., Biology and Center for Persons with Disabilities. BS 1968, PhD 1973 University of Utah.

WARREN, WYNEMA LOUISE (1992) Nurse, Center for Persons with Disabilities. BS 1966 University of Utah.

WATKINS, RICHARD BOWRING (1967) Asst. Director, Financial Aid Office. BM 1959, MM 1965 University of Utah.

WATKINS, SUSAN (1976) Program Administrator and Clinical Asst. Prof., Project SKI*HI, Communicative Disorders and Deaf Education. BS 1970, MS 1971, EdD 1984 Utah State University.

WATSON, DANIEL W. (1993) Asst. Prof., Computer Science. BSEE 1985 Tennessee Tech University, MSEE 1989, PhD 1993 Purdue University.

WATSON, NANETTE M. (1992) Preschool Teacher, Center for Persons with Disabilities. BS 1974 State University of New York College (Buffalo).

WATTS, KATHLEEN E. (1990) Specialist, Center for Persons with Disabilities. BA 1974 University of Washington, MA 1978 University of Northern Colorado.

WATZEK, CANDY J. (1988) Adjunct Lecturer, Biology. BS 1982 Augustana College.

WEBB, MELODY (1993) Adjunct Prof., History. BA 1968 University of Arizona, MA 1974 San Francisco State College, PhD 1983 University of New Mexico.

WEEDER, DELIA L. (1994) Asst. Director for Business Operations, Telecommunications and Telephone Services. BS 1986 Park College.

WEEKS, RUSSELL A. (1992) Computer Specialist/Lecturer, Mathematics and Statistics. BA 1977 Brigham Young University, MS 1985 Utah State University.

WEIMER, BART C. (1991) Asst. Prof., Ext. Specialist (Food/Nutrition), Nutrition and Food Sciences. BS 1986 University of Arizona, PhD 1990 Utah State University.

WEINSTOCK, JEROME (1988) Adjunct Prof., Electrical and Computer Engineering. BChE 1955 Copper Union University, PhD 1959 Cornell University.

WEIRATHER, YUSNITA P. (1995) Clinical Audiologist, Center for Persons with Disabilities. BA 1977 Academy of Speech Pathology (Indonesia), MS 1990 University of Montana.

WEISS, STEPHEN CRAIG (1983) Assoc. Librarian, Merrill Library and Learning Resources Program. BA 1968, MEd 1978 Utah State University.

WELKER, DENNIS L. (1984) Assoc. Prof., Biology. BA 1973 Shippensburg State College, MS 1976, PhD 1977 Pennsylvania State University.

WELKIE, GEORGE W. (1957) Assoc. Prof., Biology. BS 1952, MS 1954 Pennsylvania State University, PhD 1957 University of Wisconsin.

WELLARD, STANLEY JAMES (1979) Senior Research Engineer, Systems Division, Space Dynamics Laboratory, USU Research Foundation. BS 1973, MS 1977 University of Utah.

WELLMAN, RICHARD (1995) Research Associate, Mathematics and Statistics. BS 1988, MS 1988, PhD 1995 Utah State University.

WELLS, SCOTT D. (1993) Asst. Director for Technical Services, Telecommunications and Telephone Services.

WENINGER, QUINN R. A. (1995) Asst. Prof., Economics. BS 1988 University of Alberta, MA 1989 University of Alaska, PhD 1995 University of Maryland.

WENTZ, DELEYNE ANITA ROSALIE (1983) Asst. Librarian, Library Services, Learning Resources Program. BEd 1969 University of Alberta, MLS 1970 University of Washington.

WESS, JULIUS (1986) Adjunct Prof., Physics. PhD 1957 University of Vienna.

WEST, NANCY (1994) Programmer/Analyst, Nutrition and Food Sciences. BS 1981, MS 1993 Utah State University.

WEST, NEIL E. (1964) Prof., Rangeland Resources. BS 1960, PhD 1964 Oregon State University.

WEST, RICHARD P. (1980) Director of Training, Center for Persons with Disabilities; Prof., Special Education and Rehabilitation. BA 1972, MS 1974, PhD 1981 University of Utah.

WESTERMANN, DALE R. (1988) Adjunct Prof., Plants, Soils, and Biometeorology. BS 1963 Colorado State University, MS 1965, PhD 1969 Oregon State University.

WHEELER, JAMES THOMAS (1989) Assoc. Prof., Physics. BA 1972 Kalamazoo College, MS 1980 University of Maryland, PhD 1966 University of Chicago and Enrico Fermi Institute.

WHEELER, PAUL A. (1982) Assoc. Prof., Electrical and Computer Engineering. BA 1970, MA 1974, PhD 1978 Brigham Young University.

WHEELER, ROBERT D. (1994) Adjunct Prof., Electrical and Computer Engineering. BS 1960, BS 1961, MS 1963, PhD 1968 Utah State University.

WHEELER, SCOTT (1992) Administrator of Business Operations and Information Systems, Conference and Institute Division, Continuing Education. BS 1992 Utah State University.

WHEELWRIGHT, BARBARA J. (1995) Specialist, Special Education and Rehabilitation. BS 1969 Brigham Young University, MS 1995 Utah State University.

WHITAKER, MORRIS D. (1970) Director, International Programs and Studies; Prof., Economics. BS 1965, MS 1966 Utah State University, PhD 1970 Purdue University.

WHITE, A. BRENT (1978) Senior Research Program Engineer, Systems Division, Space Dynamics Laboratory, USU Research Foundation; Center for Atmospheric and Space Sciences; and Electrical and Computer Engineering. BS 1966 Utah State University, MS 1972 University of New Mexico.

WHITE, KARL RAYMOND (1978) Program Administrator, Center for Persons with Disabilities; Prof., Special Education and Rehabilitation, Psychology. BS 1973 Brigham Young University, MA 1974, PhD 1976 University of Colorado (Boulder).

WHITE, KENNETH L. (1991) Assoc. Prof., Animal, Dairy and Veterinary Sciences. BS 1979 Brigham Young University, MS 1982, PhD 1986 University of California (Davis).

WHITE, L. WAYNE (1983) Asst. Director, Grounds and Services, Administration, Physical Plant.

WHITE, MARIE GEMPERLINE (1987) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1984 Utah State University.

WHITE, MILTON D. (1992) Head Strength and Conditioning Coach, Intercollegiate Athletics. BSE 1984 Arkansas State University, MEd 1988 University of Arkansas (Fayetteville).

WHITE, RANDY D. (1982) Adjunct Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1972, MS 1978 Brigham Young University, PhD 1982 Oregon State University.

WHITE, TRISA (1989) Administrative Assistant, Center for Persons with Disabilities. BS 1976 Brigham Young University, MA 1984, BS 1985 Western Montana College.

WHITE, YVETTE (1988) Adjunct Lecturer, Biology. BS 1979 Utah State University.

WHITESIDES, RALPH E. (1987) Assoc. Dean for Extension and Program Leader—Agriculture, College of Agriculture; Ext. Agronomist (Crops) and Assoc. Prof., Plants, Soils, and Biometeorology. BS 1974 Utah State University, MS 1978, PhD 1979 Oregon State University.

WHITLOCK, ANDREW M. (1985) Assoc. Curator, Art Museum. BFA 1977, MFA 1979 Utah State University.

WHITTIER, DICK R. (1995) Supervisor—Meat Laboratory, Nutrition and Food Sciences. BS 1976 Utah State University.

WHITTIER, IRENE (1990) Supervisor, Personnel Services. BS 1990 Utah State University.

WICKWAR, VINCENT B. (1988) Prof., Physics and Center for Atmospheric and Space Sciences. AB 1965 Harvard College, MS 1969, PhD 1971 Rice University.

WIDAUF, DAVID P. (1986) Assoc. Prof., Industrial Technology and Education. BS 1971 California Polytechnic University, MA 1976 Pepperdine University.

WIEDMEIER, RANDALL D. (1986) Assoc. Prof., Animal, Dairy and Veterinary Sciences. BS 1975 Montana State University, MS 1980 Washington State University, PhD 1986 Utah State University.

WIGHTMAN, PAUL D. (1992) Specialist, Center for Persons with Disabilities. BS 1983 Utah State University.

WILCOX, DARRELL M. (1994) Asst. Director—Computer Operations, Financial Aid Office.

WILDE, GLENN R. (1966) Dean, Learning Resources Program. BS 1965 Weber State College, MA 1966 Utah State University, PhD 1976 University of Utah.

WILFORD, PAUL WARD (1993) Temp. Instr., Secondary Education. BA 1970 California State University (Long Beach), MA 1974, EdS 1982 Idaho State University.

WILKERSON, THOMAS D. (1992) Research Scientist, Center for Atmospheric and Space Sciences; Research Prof., Physics. BS 1953, MS 1954, PhD 1962 University of Michigan.

WILLHITE, CALVIN C. (1984) Adjunct Assoc. Prof., Animal, Dairy and Veterinary Sciences. BS 1974, MS 1977 Utah State University, PhD 1980 Dartmouth College.

WILLIAMS, DANA B. (1988) Asst. Editor, English. BA 1985, MA 1988 University of Utah.

WILLIAMS, DONNA CAROL H. (1969) Ext. Assoc. Prof. and Piute and Wayne County Agent, University Extension. BS 1957 Brigham Young University, MS 1979 Utah State University.

WILLIAMS, NANCY M. (1986) Asst. Prof., Communication. BA 1984, MS 1987 Utah State University.

WILLIAMS, R. PATRICK (1984) Fine Arts Writer and News Editor II, Information News Services. BFA 1974 Utah State University, MA 1978 University of Maryland.

WILLIAMS, SCOTT R. (1994) Ext. Asst. Prof. and Millard County Agent, University Extension. BS 1982, MS 1993 Utah State University.

WILLIAMS, STANLEY C. (1983) Prof., Mathematics and Statistics. BA 1978, MA 1980, PhD 1983 North Texas State University.

WILLIAMSON, REO L. (1980) Admin. Assistant, Animal, Dairy and Veterinary Sciences. BS 1949 University of Utah.

WILLIS, DALE LESTER (1990) System Engineer, Class Division, Continuing Education. BS 1989 Utah State University.

WILLIS, PATRICIA B. (1973) Adjunct Clinical Instr., Special Education and Rehabilitation. BS 1969, MS 1975 Utah State University.

WILSON, J. CHRISTOPHER (1995) Adjunct Asst. Prof., Animal, Dairy and Veterinary Sciences. Prevet Program 1976 Middle Tennessee State University, MS 1987 Mississippi State University, DVM 1979 University of Tennessee.

WILSON, JoANN (1989) Assoc. Prof., Human Environments. BS 1969, MFA 1972 University of Utah.

WILSON, ROLAYNE (1987) Assoc. Prof., Health, Physical Education and Recreation. BS 1970 Brigham Young University, MS 1978 Utah State University, EdD 1984 University of North Carolina (Greensboro).

WINDLEY, BRENT SHEPHERD (1976) Architect, Campus Planning and Engineering; Lecturer, Human Environments. BArch 1969 Idaho State University, MS 1971 Utah State University.

WINGER, LELAND J., Jr. (1992) Adjunct Asst. Prof., Psychology. PhD 1977 Utah State University.

WINN, DEANNA DAINES (1987) Assoc. Dean for Education, College of Education; Assoc. Prof., Elementary Education. BS 1971, MS 1976, EdD 1981 Utah State University.

WINWARD, RENE (1979) Research Technologist, Civil and Environmental Engineering.

WITTWER, CARL THOMAS (1990) Adjunct Asst. Prof., Nutrition and Food Sciences. BS 1978, PhD 1982 Utah State University, MD 1984 University of Michigan (Ann Arbor).

WOERTENDYKE, LINDA M. (1995) Program Coordinator—Howard Hughes Undergraduate Research Program, Biology. BS 1973 University of California (Santa Barbara). MNS 1985 University of Idaho.

WOFFINDEN, DUARD S. (1961) Sr. Research Engineer, Utah Water Research Laboratory. BS 1948, MS 1965 Utah State University.

WOLCOTT, EDWARD (1988) Adjunct Asst. Prof., Civil and Environmental Engineering. BS 1967 University of Kansas.

WOLCOTT, LINDA L. (1991) Asst. Prof., Instructional Technology. BS 1970 Gorham State College. MLS 1977 University of Maine, EdS 1982 Utah State University. EdD 1990 University of Georgia.

WOLF, PAUL G. (1992) Asst. Prof., Biology. BSc 1982 University of Leicester (U.K.). MA 1986 University of Kansas (Lawrence), PhD 1990 Washington State University.

WOLFE, MICHAEL L. (1970) Prof., Fisheries and Wildlife. BS 1963 Cornell University, PhD 1967 Forstliche Fakultat Der University, Gottingen.

WOLLAM, JEAN (1993) Adjunct Asst. Prof., Psychology. BA 1970, MA 1974, MS 1980 University of Utah, PhD 1986 Brigham Young University.

WOMACK, KAREN S. (1983) Adjunct Lecturer, Biology. BS 1980 Weber State College.

WOMACK, KEVIN C. (1989) Assoc. Prof., Civil and Environmental Engineering. BS 1980, MSE 1985 University of Pennsylvania, PhD 1989 Oregon State University.

WOOD, LEE G. (1990) Research Associate, Animal, Dairy and Veterinary Sciences. BS 1987 Utah State University.

WOOD, R. KENT (1962) Asst. Dept. Head and Prof., Instructional Technology. BS 1959 University of Utah, MA 1961 University of Denver, EdS 1969 Western Michigan University, EdD 1977 Brigham Young University.

WOOD, ROBERT J. (1988) Senior Electronics Specialist, Chemistry and Biochemistry.

WOODHEAD, DOUGLAS F. (1983) Research Engineer and Lecturer, Electrical and Computer Engineering and Biological and Irrigation Engineering. BS 1982 Utah State University.

WOODWARD, SCOTT R. (1988) Adjunct Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1980, PhD 1983 Utah State University.

WOOLLEY, JAY C. (1995) Director of Development for Title IX, Institutional Development, University Relations and Development.

WOOLSTENHULME, KAREN W. (1992) Ext. Asst. Prof., Uintah Basin Branch Campus, Continuing Education. BS 1990, MS 1992 Utah State University.

WORKMAN, JOHN PAUL (1970) Prof., Rangeland Resources. BS 1965 University of Wyoming, MS 1967, PhD 1970 Utah State University.

WORKMAN, LOU J. (1986) Director, Brigham City Campus; Program Specialist, Ext. Instr., and Director of Out-of-state Programs, Class Division, Continuing Education. BS 1980, MS 1987 Utah State University.

WORKMAN, WILLIAM G. "JERRY" (1995) Manager—Facilities Maintenance, Facilities Maintenance, Physical Plant. BS 1992 Utah State University.

WORTHEN, BLAINE R. (1978) Prof., Psychology. BS 1960, MS 1965 University of Utah, PhD 1968 Ohio State University.

WORWOOD, DENNIS R. (1982) Ext. Asst. Prof. and Emery County Agent (Agriculture), University Extension. BS 1982 Brigham Young University.

WRIGHT, CHRISTIAN W. (1991) Head Coach—Men's and Women's Tennis, Intercollegiate Athletics. BA 1991 Utah State University.

WRIGHT, DEAN A. (1990) Director, Food Services, Auxiliary Enterprises; Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1974 Brigham Young University.

WRIGHT, DONALD L. (1977) Manager, University Inn and Continuing Education Facilities Maintenance.

WRIGHT, JOHN WILLIAM (1991) Adjunct Prof., Physics. BS 1952 University of Maryland, DSc 1982 Brunel University (London, England).

WRIGHT, MICHAEL EUGENE (1984) Assoc. Prof., Chemistry and Biochemistry. BS 1979 San Diego State University, MS 1981, PhD 1983 University of Arizona.

WURTSBAUGH, WAYNE A. (1983) Assoc. Prof., Fisheries and Wildlife. BS 1970 University of California (Davis), MS 1973 Oregon State University, PhD 1983 University of California (Davis).

WUTHRICH, RICHARD C. (1982) Physician, Student Health Services. BS 1966 Utah State University, MD 1971 University of Oregon Medical School, Certificate in Dermatology 1975 Cleveland Clinic.

WYSE, BONITA W. (1970) Dean, College of Family Life; Prof., Nutrition and Food Sciences. BS 1967 Notre Dame, MS 1970 Michigan State University, PhD 1977 Colorado State University.

XU, ZHIQUAN (1990) Visiting Assoc. Prof., Electrical and Computer Engineering.

YAMASAKI, SHELDON GRANT (1985) TV Producer/Director, Multimedia and Distance Learning Services; Adjunct Lecturer, Communication. BS 1973 Utah State University.

YANG, SHIGUANG (1991) Research Asst. Prof., Animal, Dairy and Veterinary Sciences. BS 1982 Anhui Agricultural University, MS 1984 Nanjing Agricultural University, PhD 1989 Purdue University.

YAP-SALINAS, HUMBERTO L. (1980) Visiting Prof. and Irrigation Engineer, Biological and Irrigation Engineering; Director, International Irrigation Center. BS 1964 Universidad Nacional Agraria, MS 1971 Purdue University.

YAZZIE-KING, ELA (1991) Specialist, Center for Persons with Disabilities. BA 1977 Virginia Intermont College, MA 1981 University of New Mexico.

YE, ZHENGWU (1993) Visiting Scientist, Computer Science. MS 1989 Naikai University (Tianjin).

YENER, MUZZ (1986) Prof., Civil and Environmental Engineering. BSCE 1969, MSCE 1971 New York University, PhD 1979 Cornell University.

YONK, NANCY D. (1981) Manager—Business Office, Center for Persons with Disabilities.

YONKEE, WILLIAM A. (1994) Adjunct Asst. Prof., Geology. BS 1980, MS 1983 University of Wyoming, PhD 1990 University of Utah.

YORK, ELIZABETH (1995) Asst. Prof., Music. BA 1974 University of Georgia, MS 1993, PhD 1995 University of Miami.

YOUNG, CATHY (1995) Temp. Lecturer, Intensive English Language Institute. BA 1984 Wheaton College (Illinois), MA 1987 University of Iowa (Iowa City), MA 1994 Northern Arizona University.

YOUNG, K. RICHARD (1978) Prof., Special Education and Rehabilitation. BS 1969, MS 1971, PhD 1973 University of Utah.

YOUNG, LOUISE P. (1984) Temp. Instr., Human Environments; Temp. Clothing and Textiles Specialist, University Extension. BS 1964, MS 1983 Utah State University.

YOUNG, MARY DAVEE (1989) Adjunct Clinical Lecturer, Nutrition and Food Sciences. BS 1982 Purdue University.

YOUNG, STANFORD A. (1980) Research Prof., Plants, Soils, and Biometeorology. BS 1971, MS 1973 Utah State University, PhD 1977 Oregon State University.

YOUSSEF, NABIL N. (1966) Prof., Biology. BS 1958 AIN-Sham University, MS 1964, PhD 1966 Utah State University.

ZEEK, LEANNE A. (1995) Asst. Volleyball Coach, Intercollegiate Athletics. BS 1990 Lamar University.

ZELLER, DAVID H. (1995) Video Engineer, Multimedia and Distance Learning Services. BS 1994 Utah State University.

ZHANG, JIANPING (1990) Asst. Prof., Computer Science. BS 1982 Wuhan University (China), PhD 1990 University of Illinois (Urbana).

ZHENG, XIADONG (1994) Asst. Prof., Mathematics and Statistics. BS 1989 Fudan University (Shanghai, China), PhD 1994 University of Wisconsin (Madison).

ZHU, LIE (1990) Research Asst. Prof., Physics and Center for Atmospheric and Space Sciences. BS 1982, MS 1985 University of Science and Technology of China, PhD 1990 Geophysical Institute—University of Alaska.

ZIMMERMAN, LINDA (1988) Adviser, Programs and Entertainment, Student Services.

ZINSER, L. MICHAEL (1990) Adjunct Assoc. Prof., Communication. BA 1971 University of Cincinnati, JD 1975 Vanderbilt University School of Law.

ZOLLINGER, LORIN J. (1979) Senior Research Engineer, Systems Division. Space Dynamics Laboratory, USU Research Foundation. BS 1971 Utah State University.

ZOMENO, FUENCISLA (1991) Asst. Prof., Languages and Philosophy. BA 1978 Universidad Complutense de Madrid, MA 1986, PhD 1991 Tulane University.

ZSIRAY, STEPHEN W. (1994) Adjunct Prof., Elementary Education. BA 1973 Belknap College (New Hampshire), MS 1976, EdD 1986 Utah State University.

Federal Collaborators

AMACHER, MICHAEL C. (1989) Research Soil Chemist, USDA Forestry Sciences Laboratory; Adjunct Prof., Plants, Soils and Biometeorology. BA 1972, MS 1978, PhD 1981 Pennsylvania State University.

ASAY, KAY H. (1974) Research Geneticist, USDA Agricultural Research Service; Adjunct Prof., Plants, Soils, and Biometeorology. BS 1957, MS 1959 University of Wyoming, PhD 1965 Iowa State University.

AUSTIN, DENNIS (1972) Research Wildlife Biologist, Division of Wildlife Resources. BS 1970, MS 1972 Utah State University.

BALLS, LEW DELL (1965) Animal Scientist, USDA Agricultural Research Service. BS 1960 Utah State University.

BARTOS, DALE L. (1972) Ecologist, USDA Forest Sciences Laboratory. BS 1966, MS 1968 Kansas State University (Fort Hays), PhD 1977 Colorado State University.

BEAUCHAMP, DAVID A. (1990) Asst. Unit Leader—Fisheries, Utah Cooperative Fish and Wildlife Research Unit; Asst. Prof., Fisheries and Wildlife. BS 1980, MS 1982, PhD 1987 University of Washington.

BENTZ, BARBARA J. (1992) Research Entomologist, USDA Forest Service Intermountain Research Station; Asst. Prof. (Nontenure), Forest Resources. BS 1981 Stephen F. Austin State University, MS 1984 University of Idaho, PhD 1991 Virginia Polytechnic Institute and State University.

BISSONETTE, JOHN A. (1985) Leader, Utah Cooperative Fish and Wildlife Research Unit; Prof., Fisheries and Wildlife; Adjunct Prof., Geography and Earth Resources. BA 1964 University of Vermont, MFS 1970 Yale University, PhD 1976 University of Michigan.

BOHART, GEORGE E. (1947) Entomologist, USDA Agricultural Research Service; Adjunct Prof. Emeritus of Biology. BS 1938, MS 1939, PhD 1947 University of California.

BROWN, RAYMOND W. (1965) Adjunct Prof., Plants, Soils, and Biometeorology; Project Leader—Reclamation, USDA Forestry Sciences Laboratory. BS 1963, MS 1965 University of Montana, PhD 1974 Utah State University.

BURNS, RICHARD J. (1974) Wildlife Research Biologist, USDA/APHIS/ADC Predator Ecology Project. BS 1962, MS 1968 Utah State University.

CARTER, DAVID L. (1967) USDA Agricultural Research Service; Research Prof., Plants, Soils, and Biometeorology. BS 1955, MS 1956 Utah State University, PhD 1960 Oregon State University.

CARVER, ROYAL THAIR (1966) Veterinary Services (APHIS), USDA. BS 1951 Utah State University, DVM 1959 Washington State University, MS 1969 Utah State University.

CHATTERTON, N. JERRY (1981) Adjunct Prof., Plants, Soils, and Biometeorology; Research Leader/Physiologist, USDA Agricultural Research Service. BS 1966 Utah State University, MS 1968, PhD 1970 University of California (Riverside).

COLLINGE, MARK (1977) Biological Technician, Predator Ecology and Behavior Project. BS 1976 Kansas State University.

COX, JERRY R. (1991) Range Scientist, USDA Agricultural Research Service (Tucson, Arizona). BS 1970, MS 1974 New Mexico State University, PhD 1978 University of Wyoming.

DALGLEISH, DOUGLAS G. (1990) Research Chemist, USDA Agricultural Research Service; Adjunct Prof., Nutrition and Food Sciences. BS 1964, PhD 1967 University of Edinburgh.

EDWARDS, THOMAS C., Jr. (1988) Asst. Unit Leader—Wildlife, Utah Cooperative Fish and Wildlife Research Unit; Asst. Prof., Fisheries and Wildlife; Adjunct Asst. Prof., Geography and Earth Resources. BS 1980, MS 1983 University of New Mexico, PhD 1987 University of Florida.

GOEDE, RONALD W. (1966) Utah Dept. of Natural Resources, Division of Wildlife Resources. BS 1967 University of Nebraska, MS 1961 Utah State University.

GRIFFIN, GERALD D. (1963) Research Nematologist, USDA Agricultural Research Service; Adjunct Prof., Plants, Soils, and Biometeorology. BS 1953, MS 1956 University of Utah, PhD 1962 University of Wisconsin.

HANSEN, W. THERON, II (1967) Agronomist, USDA Agricultural Research Service. BS 1966, MS 1972 Utah State University.

HSIAO, CATHERINE T. (1971) Botanist, USDA Agricultural Research Service; Research Associate, Biology. BS 1961 Taiwan Provincial College, MS 1965 University of Illinois.

JAMES, LYNN F. (1957) Research Animal Scientist, USDA Agricultural Research Service; Adjunct Prof., Animal, Dairy and Veterinary Sciences. BS 1950, MS 1957, PhD 1966 Utah State University.

JENSEN, KEVIN B. (1988) Research Plant Geneticist, USDA Agricultural Research Service; Adjunct Asst. Prof., Plants, Soils, and Biometeorology. BS 1983, MS 1985 Utah State University, PhD 1988 Texas A&M University.

JENSEN, MARVIN E. (1967) USDA Agricultural Research Service. BS 1951, MS 1952 North Dakota State University, PhD 1965 Colorado State University.

JOHNSON, DOUGLAS A. (1976) Plant Physiologist, USDA Agricultural Research Service; Adjunct Prof., Rangeland Resources. BA 1971 Augustana College, MS 1973 Utah State University, PhD 1975 Utah State University.

KEELER, RICHARD F. (1965) USDA Agricultural Research Service; Research Prof., Animal, Dairy and Veterinary Sciences; Adjunct Prof., Biology. BS 1954 Brigham Young University, MS 1955, PhD 1957 Ohio State University.

KERSHNER, JEFFREY L. (1988) USDA Forest Service; Research Asst. Prof., Fisheries and Wildlife. BS 1976, MS 1982 Humboldt State University, PhD 1991 University of California (Davis).

KNOWLTON, FREDERICK F. (1972) Research Assoc. Prof., Fisheries and Wildlife; Leader, Predator Ecology and Behavior Project. BS 1957 Cornell University, MS 1959 Montana State College, PhD 1964 Purdue University.

LOGAN, JESSE A. (1992) Project Leader—Mountain Pine Beetle, USDA Forest Service Intermountain Research Station; Prof. (Nontenure), Forest Resources. BS 1967, MS 1969 Colorado State University, PhD 1977 Washington State University.

MASON, J. RUSSELL (1995) Project Leader, USDA/APHIS/ADC Predator Ecology Project; Research Prof. (FC), Fisheries and Wildlife. BA 1976 DePauw University, MA 1978, PhD 1980 Clark University.

MAYLAND, HENRY F. (1967) USDA Agricultural Research Service; Research Prof., Plants, Soils, and Biometeorology; Adjunct Prof., Rangeland Resources. BS 1960, MS 1961 University of Wyoming, PhD 1965 University of Arizona.

MOORE, R. GILBERT (1977) Adjunct Prof., Physics, Morton-Thiokol Chemical Corp. BS 1949 New Mexico State University.

MUEGGLER, WALTER F. (1949) Emeritus Scientist, USDA Forestry Sciences Laboratory. BS 1949, MS 1953, PhD 1961 Duke University.

NYE, WILLIAM P. (1947) USDA Agricultural Research Service. BS 1940, MS 1947 Utah State University.

OLMSTEAD, STANLEY (1985) Biological Technician, Predator Ecology and Behavior Project. BA 1975 California State University (Fresno).

OLSEN, JOHN D. (1972) Veterinary Medical Officer, Veterinary Science; Adjunct Research Assoc. Prof., Animal, Dairy and Veterinary Sciences. BS 1959 Utah State

University, MS 1967 Iowa State University, DVM 1961 Kansas State University, PhD 1974 Iowa State University.

PFISTER, JAMES A. (1986) Range Scientist, USDA Poisonous Plant Laboratory; Adjunct Assoc. Prof., Rangeland Resources. BS 1977 Utah State University, MS 1979 New Mexico State University, PhD 1983 Utah State University.

RALPHS, MICHAEL H. (1986) Range Scientist, USDA Poisonous Plant Laboratory; Adjunct Assoc. Prof., Rangeland Resources. BS 1974, MS 1978 Utah State University, PhD 1983 Texas A&M University.

RUMBAUGH, MELVIN D. (1977) Research Plant Geneticist, USDA Agricultural Research Service; Adjunct Prof., Plants, Soils, and Biometeorology. BS 1951 Central College, MS 1953, PhD 1958 University of Nebraska.

SCHNARE, JON KEITH (1995) USDA Forest Service, Intermountain Region; Adjunct Instr., Forest Resources. BS 1966, MS 1978 Oregon State University.

STODDART, L. CHARLES (1972) Research Biologist, Ecology Center, Predator Ecology and Behavior Project; Research Asst. Prof., Fisheries and Wildlife. BS 1960, MS 1962, PhD 1972 Utah State University.

TEPEDINO, VINCENT J. (1978) Adjunct Assoc. Prof., Biology; Research Entomologist, USDA Agricultural Research Service. BS 1971 Brooklyn College of the City University of New York, PhD 1979 University of Wyoming.

TERRILL, CLAIR E. (1986) Federal Collaborator, Agricultural Research Service (Beltsville, Maryland); Adjunct Prof., Animal, Dairy and Veterinary Sciences. BS 1932 Iowa State University, PhD 1936 University of Missouri.

TORCHIO, PHILIP F. (1963) Research Entomologist, USDA Agricultural Research Service; Adjunct Asst. Prof., Biology. BS 1956 San Jose State College, MS 1966 Oregon State University.

WINN, DAVID S. (1991) USDA Forest Service; Research Asst. Prof., Geography and Earth Resources. BS 1959, MS 1972, PhD 1976 Utah State University.

WRIGHT, JAMES L. (1967) USDA Agricultural Research Service; Research Assoc. Prof., Plants, Soils, and Biometeorology. BS 1959, MS 1961 Utah State University, PhD 1965 Cornell University.

ZEMLICKA, DORIS (1986) Wildlife Biologist, Predator Ecology and Behavior Project. BA 1977 Oregon State University.

Emeritus Faculty

ABRAMS, MILTON C. (1949) University Librarian and Director Emeritus of Learning Resources Program; Prof. Emeritus of Political Science. BA 1948, MS 1952 Utah State University, PhD 1963 University of Utah.

ACCORD, CLAIR R. (1947) Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1937 Utah State University, MS 1956 University of Illinois, PhD 1967 University of Kentucky.

ADKINS, BRYCE E. (1964) Prof. Emeritus of Elementary Education. AB 1949 Peru State College, MA 1954, PhD 1958 State University of Iowa.

ALLEN, GERALD L. (1961) Assoc. Prof. Emeritus of Communication. BS 1960, MS 1965 Utah State University.

ALLEN, J. WHORTON (1964) Asst. Prof. Emeritus of Psychology. BS 1955 Brigham Young University, EdD 1969 Utah State University.

ALLEN, ROSS R. (1966) Prof. Emeritus of Secondary Education. BS 1952, MS 1955, EdD 1962 University of Utah.

ALLRED, A. FULLMER (1945) Assoc. Prof. Emeritus of Plant Science, College of Agriculture, and University Extension. BS 1938 Brigham Young University, MS 1966 Utah State University.

ALLRED, E. MALCOM (1961) Prof. Emeritus of Elementary Education. BA 1948 Southern Idaho College of Education, MS 1953 University of Idaho, EdD 1961 University of Northern Colorado.

ALLRED, JR (1958) Director Emeritus of Information News Services; Asst. Prof. Emeritus of Communication. BA 1950 University of Utah, MS 1964 Colorado State University.

ALLRED, KEITH R. (1957) Prof. Emeritus of Plants, Soils, and Biometeorology. BS 1951 Brigham Young University, PhD 1955 Cornell University.

ANDERSON, MELVIN J. (1986) Research Assoc. Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1950 Utah State University, MS 1957, PhD 1959 Cornell University.

ANDERSON, JARVIS L. (1968) Prof. Emeritus of English and Theatre Arts. BS 1958, MS 1959 Utah State University, PhD 1971 University of Minnesota.

ANDERSON, JAY O. (1951) Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1943 Utah State University, MS 1948, PhD 1950 University of Maryland.

ANDERSON, ROICE H. (1947) Prof. Emeritus of Economics. BS 1935 University of Wyoming, MS 1941, PhD 1943 Cornell University.

***ANDREWS, WADE H.** (1965) Prof. Emeritus of Sociology, Social Work and Anthropology. BS 1947, MS 1949 Utah State University, PhD 1956 Michigan State University.

ASHCROFT, GAYLEN L. (1961) Assoc. Prof. Emeritus of Plants, Soils, and Biometeorology. BS 1954, MS 1956 Utah State University, PhD 1962 Oregon State University.

AUSTIN, JOSEPH WELLS (1974) Assoc. Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1958 Utah State University, MS 1961 University of Tennessee, PhD 1967 Texas A&M University.

BACON, MARY R. (1948) Assoc. Prof. Emeritus of University Extension. BS 1929 University of Utah, MS 1964 Brigham Young University.

BAGLEY, JAY M. (1954) Prof. Emeritus of Utah Water Research Laboratory and Civil and Environmental Engineering. BS 1952, MS 1953 Utah State University, PhD 1964 Stanford University, PE.

***BAHLER, THOMAS L.** (1949) Prof. Emeritus of Biology. BS 1943 College of Wooster, PhD 1949 University of Wisconsin.

BAIRD, GLENN T. (1946) Assoc. Prof. Emeritus of University Extension. BS 1935 Utah State University, MS 1964 University of Maryland.

BALLAM, ORAL L. (1963) Dean Emeritus of College of Education; Prof. Emeritus of Elementary Education. BS 1949, MS 1955 Utah State University, EdD 1961 University of California (Los Angeles).

BARDWELL, FLORA H. (1950) Assoc. Prof. Emeritus of Nutrition and Food Sciences. BS 1940 Brigham Young University, MS 1963 Utah State University.

BARLOW, JOEL C. (1946) Assoc. Prof. Emeritus of Plant Science, University Extension. BS 1938, MS 1963 Utah State University.

***BECKSTRAND, GORDON L.** (1982) Ext. Prof. Emeritus of University Extension. BS 1950 Utah State University, MS 1958, PhD 1959 University of Wisconsin.

BENBOW, JERRY L. (1967) Assoc. Prof. Emeritus of Languages and Philosophy. BA 1959, MA 1964 Ohio University, PhD 1970 University of New Mexico.

BENCH, VARNELL A. (1975) Assoc. Dean Emeritus for Continuing Education and Field Services, College of Education; Assoc. Prof. Emeritus of University Extension and Secondary Education. BS 1963, MS 1968, EdD 1971 Utah State University.

BENDIXSEN, KAY R. (1952) Prof. Emeritus of University Extension. BS 1951, MS 1952 Utah State University, PhD 1965 Michigan State University.

BENNETT, JAMES A. (1945) Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1940, MS 1941 Utah State University, PhD 1957 University of Minnesota.

BERG, FREDERICK S. (1965) Prof. Emeritus of Communicative Disorders. BS 1952 Washington University, MS 1956, PhD 1960 Southern Illinois University.

BERTOCH, MICHAEL R. (1967) Prof. Emeritus of Psychology. BS 1957, MEd 1958 Idaho State University, EdD 1967 Boston University.

BEUTLER, G. LEON (1954) Assoc. Prof. Emeritus of Instructional Technology. BS 1950, MS 1959 Utah State University.

BEYERS, CORALIE (1964) Asst. Prof. Emeritus of English. BA 1948, MA 1950 University of Utah.

BEYERS, JOHN M. (1957) Assoc. Prof. Emeritus of Languages and Philosophy. BA 1949, MA 1953 University of Utah.

BLACK, FARRELL J. (1961) Asst. Prof. Emeritus of Theatre Arts. BS 1959, MS 1962 Utah State University.

***BLACK, THEREL R.** (1950) Prof. Emeritus of Sociology, Social Work and Anthropology. BS 1939 Brigham Young University, MA 1941 Louisiana State University, PhD 1951 University of Wisconsin.

***BLAKE, JOSEPH T.** (1956) Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1949 Brigham Young University, MS 1950, PhD 1955, DVM 1956 Iowa State University.

BLASER, LEROY A. (1952) Prof. Emeritus of Education. BS 1936, MS 1944 Utah State University, EdD 1955 University of California.

***BOOTH, THORNTON Y.** (1953) Prof. Emeritus of English. AB 1941 Brigham Young University, PhD 1951 Stanford University.

BOWDEN, JOAN C. (1960) Asst. Prof. Emeritus of Elementary Education. BS 1942, MEd 1964 Utah State University.

BOWMAN, JAMES T., Jr. (1965) Prof. Emeritus of Biology. BS 1961 Duke University, PhD 1965 University of California (Davis).

BOX, THADIS W. (1970) Prof. Emeritus of Range Science. BS 1956 Southwest Texas State College, MS 1957, PhD 1959 Texas A&M University.

***BOYLE, WILLIAM S.** (1945) Prof. Emeritus of Biology. BS 1937 Brigham Young University, MS 1939, PhD 1943 University of California.

BRANDT, LEROY C., Jr. (1952) Assoc. Prof. Emeritus of Theatre Arts. BFA 1957, MFA 1958 Boston University.

BROADBENT, DEE A. (1938) Prof. Emeritus of Economics; Emeritus Vice President for Special Projects. BS 1936 Utah State University, MS 1938 University of Illinois.

BUCK, RULON (1949) Asst. Prof. Emeritus of University Extension. BS 1948, MS 1953 Utah State University.

BUEHLER, VERNON M. (1968) Prof. Emeritus of Business Administration and Management and Human Resources. BS 1941 Utah State University, MBA 1948 Harvard University, PhD 1964 George Washington University, CPA 1953 State of Utah.

BURNETT, NOLAN K. (1958) Asst. Prof. Emeritus of Health, Physical Education and Recreation. BS 1950, MS 1958 Utah State University.

***BURTENSHAW, CLAUDE J.** (1962) Prof. Emeritus of Political Science. BS 1947, MS 1948, PhD 1955 University of Utah.

BURTENSHAW, G. RAY (1944) Assoc. Prof. Emeritus of University Extension. BS 1940 Utah State University, MEd 1963 Colorado State University.

BUTCHER, JOHN E. (1955) Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1950, MS 1952 Montana State College, PhD 1956 Utah State University.

BYLUND, H. BRUCE (1964) Prof. Emeritus of Sociology, Social Work and Anthropology. BS 1950, MS 1951 Brigham Young University, PhD 1954 Pennsylvania State University.

CALL, ANSON B. (1928) Assoc. Prof. Emeritus of Plant Science. BS 1927, MS 1928 Brigham Young University.

CALL, JAY W. (1958) Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1952 Utah State University, DVM 1956 Colorado State University, MS 1966 University of Guelph.

CALL, W. VOSCO (1955) Prof. Emeritus of Theatre Arts. BS 1951 Utah State University, MA 1958 University of Washington.

CANFIELD, RONALD VIRGIL (1968) Prof. Emeritus of Mathematics and Statistics. BS 1956, MS 1961 Brigham Young University, PhD 1975 University of Wyoming.

CANNON, MELVIN C. (1946) Prof. Emeritus of Chemistry and Biochemistry. BS 1933, MS 1938 University of Utah, PhD 1941 Boston University.

CANNON, NORMAN S. (1947) Prof. Emeritus of School of Accountancy. BS 1938 University of Utah, MS 1939, PhD 1957 Columbia University, CPA 1950 State of Utah.

CANNON, ORSON S. (1948) Prof. Emeritus of Botany. BS 1935, MS 1937 Utah State University, PhD 1943 Cornell University.

CARIGAN, MARY ELIZABETH (1968) Asst. Prof. Emeritus of Elementary Education. BS 1951 University of Kentucky, MS 1968 Utah State University.

CARLISLE, HOWARD MYRON (1963) Prof. Emeritus of Business Administration, Management and Human Resources. BS 1950 Utah State University, MS 1952 University of Wisconsin.

CARLISLE, JOHN W. (1966) Clinical Prof. Emeritus of Biology. BS 1952 Utah State University, MD 1956 University of Utah, Pediatrics Residency 1959 University of Minnesota.

CARTER, WINFRED O. (1961) Prof. Emeritus of Civil and Environmental Engineering. BS 1953 University of Maryland, MS 1959, PhD 1964 Stanford University, PE.

CASTO, GLENDON W. (1962) Prof. Emeritus of Psychology. BS 1950, MS 1960 Utah State University, PhD 1966 University of Utah.

CHADWICK, DUANE G. (1957) Assoc. Prof. Emeritus of Electrical Engineering and Utah Water Research Laboratory. BS 1952 Utah State University, MS 1957 University of Washington.

CHASE, ALICE (1969) Instr. Emeritus of Edith Bowen Laboratory School. BA 1936 University of Wyoming, MEd 1962, EdD (honorary) 1978 Utah State University.

CHATELAIN, JACK E. (1957) Prof. Emeritus of Physics. BS 1947, MS 1948 Utah State University, PhD 1957 Lehigh University.

CHATELAIN, LARAE B. (1969) Assoc. Prof. Emeritus of Home Economics and Consumer Education. BS 1946, MS 1969 Utah State University, PhD 1980 Florida State University.

CHRISTENSEN, PAUL D. (1954) Prof. Emeritus of Soil Science and Biometeorology. BS 1937 Brigham Young University, MS 1948 Utah State University, PhD 1950 Rutgers University.

CHRISTENSEN, RONDO A. (1957) Prof. Emeritus of Economics. BS 1954 Utah State University, MS 1955, PhD 1957 Cornell University.

CHRISTIANSEN, DELRAE (1963) Assoc. Prof. Emeritus of English. BS 1937 Brigham Young University, BA 1949, MA 1949 University of Utah, PhD 1951 University of Manchester, England.

CLARK, C. ELMER (1952) Assoc. Director Emeritus of Agricultural Experiment Station; Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1950 Utah State University, MS 1960, PhD 1962 University of Maryland.

***CLARK, CLAYTON** (1937) Prof. Emeritus of Electrical Engineering. BS 1933 Utah State University, EE 1947, PhD 1957 Stanford University.

CLARK, JOSEPHINE DAINES (1974) Ext. Instr. Emeritus, University Extension. BS 1949 Utah State University.

CLARK, RALPH T. (1963) Prof. Emeritus of Art. BS 1950 Utah State University, BPA 1958 Art Center School (Los Angeles), MFA 1969 Utah State University.

CLARK, THOMAS C. (1966) Prof. Emeritus of Communicative Disorders. BS 1956 Brigham Young University, MS 1959 Gallaudet College, PhD 1979 University of North Carolina.

CLAYTON, RUTH V. (1962) Asst. Prof. Emeritus of Home Economics and Consumer Education. BS 1947, MS 1953 Utah State University, PhD 1986 Purdue University.

CLEMENT, LLOYD A. (1954) Assoc. Prof. Emeritus of Economics; Emeritus Agricultural Economist, University Extension. BS 1954 Utah State University, MPA 1959 Harvard University.

CLYDE, CALVIN G. (1963) Prof. Emeritus of Civil and Environmental Engineering, Agricultural and Irrigation Engineering, and Utah Water Research Laboratory. BS 1951 University of Utah, MS 1952, CE 1953, PhD 1961 University of California (Berkeley), PE Licensed Land Surveyor.

***CORDON, WILLIAM A.** (1956) Prof. Emeritus of Civil and Environmental Engineering. BS 1935, MS 1962 Utah State University, PE.

CULMSEE, CARLTON F. (1945) Prof. Emeritus of American Civilization; Emeritus Dean of Humanities and Arts. BS 1932, MA 1937 Brigham Young University, PhD 1940 State University of Iowa.

DAINES, SPENCER H. (1943) Assoc. Prof. Emeritus of Agricultural and Irrigation Engineering. BS 1942 Utah State University, MS 1950 Kansas State University, PE.

DALBY, MAX F. (1957) Prof. Emeritus of Music; Director of Bands Emeritus. AB 1942 Brigham Young University, MA 1950 San Diego State College, EdD 1961 Utah State University.

DANIEL, THEODORE W. (1944) Prof. Emeritus of Forest Science. BS 1934, MS 1936, PhD 1942 University of California (Berkeley).

DANIELS, PAUL R. (1953) Assoc. Prof. Emeritus of University Extension. BS 1948 Utah State University, MEd 1964 Colorado State University.

DARLEY, ELIZABETH (1954) Assoc. Prof. Emeritus of University Extension. BS 1935 Utah State University, MEd 1964 Colorado State University.

DAVIS, DONALD W. (1954) Prof. Emeritus of Biology. BS 1941, PhD 1950 University of California (Berkeley).

DAVIS, LYNN H. (1950) Prof. Emeritus of Economics. BS 1949, MS 1953 Utah State University, PhD 1961 Oregon State University.

DEHART, WILLIAM A. (1951) Prof. Emeritus of Sociology, Social Work and Anthropology. BS 1937 Brigham Young University, MA 1941 University of Minnesota, PhD 1950 University of Wisconsin.

DEWEY, WADE G. (1956) Prof. Emeritus of Plant Science. BS 1953 Utah State University, PhD 1956 Cornell University.

DIXON, KEITH L. (1959) Prof. Emeritus of Biology. AB 1943 San Diego State College, MA 1948, PhD 1953 University of California (Berkeley).

DOBSON, DONALD C. (1957) Assoc. Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1954 Utah State University, MS 1955 Cornell University, PhD 1961 Utah State University.

DOBSON, WILLIAM R. (1973) Assoc. Prof. Emeritus of Psychology. BS 1947, MS 1948 Utah State University, PhD 1951 Purdue University.

DORST, HOWARD E. (1936) Prof. Emeritus of Zoology. AB 1929, MA 1930 University of Kansas.

DOWNS, LOIS (1949) Assoc. Prof. Emeritus of Health, Physical Education and Recreation. BS 1945, MS 1949 Utah State University.

DRAKE, ELDON M. (1951) Prof. Emeritus of Secondary Education. BS 1943 Utah State University, MS 1949, PhD 1951 Iowa State University.

DRAPER, C.I. (1941) Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1939 Utah State University, PhD 1953 Iowa State University.

DRURY, LLOYD A. (1962) Prof. Emeritus of University Extension; Adjunct Prof. Emeritus of Family and Human Development. BA 1947 Southern Idaho College of Education, MA 1948 Colorado State University, EdD 1952 University of Wyoming.

***DUNN, IRVING S.** (1963) Prof. Emeritus of Civil and Environmental Engineering. BS 1948, MS 1949 Utah State University, PhD 1957 Stanford University, PE.

DWYER, DON D. (1971) Prof. Emeritus of Range Science. BS 1956, MS 1958 Fort Hays Kansas State College, PhD 1960 Texas A&M University.

ELICH, JOE (1946) Prof. Emeritus of Mathematics. BS 1940 Utah State University, MA 1942 University of California (Berkeley).

ELLER, JESSIE M. (1944) Asst. Prof. Emeritus of University Extension. BS 1940, MS 1970 Utah State University.

ELLSWORTH, S. GEORGE (1951) Prof. Emeritus of History and Geography. BS 1941 Utah State University, MA 1947, PhD 1951 University of California (Berkeley).

***EMBRY, BERTIS L.** (1946) Prof. Emeritus of Electrical Engineering and Agricultural and Irrigation Engineering. BS 1941, MS 1949 Utah State University, DEngr 1954 Stanford University, PhD 1966 University of Missouri, PE.

ERNSTROM, C. ANTHON (1965) Prof. Emeritus of Nutrition and Food Sciences. BS 1949, MS 1951 Utah State University, PhD 1956 University of Wisconsin.

ESPLIN, GRANT M. (1946) Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1943 Utah State University, MS 1962 University of Arizona.

ESPLIN, LYNN J. (1958) Assoc. Prof. Emeritus of University Extension. BS 1954 Utah State University, MS 1965 Colorado State University.

ESPLIN, MARVA WINGET (1967) Ext. Instr. Emeritus of University Extension. BS 1964 Utah State University.

***FARLEY, THOMAS M.** (1967) Assoc. Prof. Emeritus of Chemistry and Biochemistry. BS 1959, MS 1961 North Dakota State University, PhD 1965 University of Wisconsin.

FARNSWORTH, WILLIAM F. (1954) Prof. Emeritus of Agricultural Education. BA 1952 Brigham Young University, MS 1954 Utah State University, PhD 1963 University of Wisconsin.

***FARRER, KENNETH C.** (1965) Prof. Emeritus of Secondary Education and EdD Program. BS 1940 University of Utah, MA 1946 University of California (Berkeley), EdD 1953 University of Utah.

FIFIELD, GLEN A. (1968) Prof. Emeritus of Music. BA 1956 Idaho State University, MS 1961 Utah State University, PhD 1980 Arizona State University.

FINCH, RAY H. (1955) Assoc. Prof. Emeritus of University Extension. BS 1938, MS 1967 Utah State University.

FLAMMER, GORDON H. (1958) Prof. Emeritus of Civil and Environmental Engineering. BS 1952, MS 1953 Utah State University, PhD 1958 University of Minnesota.

***FLETCHER, JOEL E.** (1963) Prof. Emeritus of Civil and Environmental Engineering and Utah Water Research Laboratory. BS 1934, MS 1937 Utah State University.

FONNESBECK, PAUL V. (1970) Research Asst. Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1953 Brigham Young University, MS 1959, PhD 1962 Utah State University.

FOOTE, WARREN C. (1958) Prof. Emeritus of Animal, Dairy and Veterinary Sciences and Biology. BS 1954 Utah State University, MS 1955, PhD 1958 University of Wisconsin.

FRANCE, EDWARD LEROY (1940) Assoc. Prof. Emeritus of Industrial Technology and Education. BS 1941, MS 1960 Utah State University.

FRANDSEN, ARDEN N. (1937) Prof. Emeritus of Psychology. BS 1921, MS 1929 University of Utah, PhD 1932 University of Minnesota.

FUNK, C. DENNIS (1953) Prof. Emeritus and Assoc. Vice President Emeritus for University Extension. BS 1953 Utah State University, MS 1965, PhD 1968 University of Wisconsin.

GRIFFIN, RICHARD E. (1965) Prof. and Water Resource Specialist Emeritus of Agricultural and Irrigation Engineering. BS 1951, MS 1960 Utah State University.

GRIMSHAW, PAUL R. (1952) Prof. Emeritus of Economics. BS 1948, MS 1949 Utah State University, PhD 1971 Oregon State University.

GROUTAGE, HARRISON T. (1955) Prof. Emeritus of Art. BA 1954 Brigham Young University, MFA 1955 University of Utah.

GUNNELL, EDITH NYMAN (1955) Assoc. Prof. Emeritus of Home Economics and Consumer Education. BS 1943, MS 1958 Utah State University.

GUNNELL, MERRILL H. (1947) Assoc. Prof. Emeritus of Zoology. BS 1930, MS 1949 Utah State University.

HAILES, CHARLES W. (1949) Assoc. Prof. Emeritus of Industrial Technology. BS 1948, MS 1953 Utah State University, EdD 1969 Pennsylvania State University.

HALE, LARZETTE G. (1972) Prof. Emeritus of School of Accountancy. BS 1940 Langston University, MS 1943, PhD 1955 University of Wisconsin, CPA 1951 State of Georgia, 1960 State of Oklahoma, 1975 State of Utah.

HALES, BARBARA M. (1965) Asst. Prof. Emeritus of Theatre Arts. BS 1950, MS 1951 Utah State University.

HAMMOND, ROBERT G. (1956) Assoc. Prof. Emeritus of Mathematics. BS 1948, MS 1952 Utah State University.

HAMSON, ALVIN R. (1955) Prof. Emeritus of Plants, Soils, and Biometeorology. BS 1948 Utah State University, PhD 1952 Cornell University.

HANKS, RONALD JOHN (1968) Prof. Emeritus of Plants, Soils, and Biometeorology. BS 1949 Brigham Young University, MS 1952, PhD 1953 University of Wisconsin.

***HANSEN, BURRELL F.** (1948) Prof. Emeritus of Communication. BS 1940 Utah State University, MS 1942 Purdue University, PhD 1953 University of Minnesota.

HANSEN, DOROTHY KIRK (1967) Asst. Prof. Emeritus of University Extension. BS 1962, MS 1969 University of Utah.

***HANSEN, ROGER GAURTH** (1968) Distinguished Prof. Emeritus of Chemistry and Biochemistry and Nutrition and Food Sciences. BS 1944, MS 1946, PhD 1948 University of Wisconsin.

HANSON, WILFORD J. (1962) Assoc. Prof. Emeritus of Biology. BS 1953 Utah State University, MS 1955, PhD 1968 University of Kansas.

HARDY, CLYDE T. (1950) Prof. Emeritus of Geology. BA 1943, MS 1948, PhD 1949 Ohio State University.

HARGREAVES, GEORGE H. (1970) Research Prof. Emeritus of Agricultural and Irrigation Engineering. BS 1943 University of Wyoming.

HARMON, M. JUDD (1951) Prof. Emeritus of Political Science. BS 1948 Utah State University, MS 1950, PhD 1953 University of Wisconsin.

HATCH, EASTMAN N. (1969) Prof. Emeritus of Physics. BS 1950 Stanford University, PhD 1956 California Institute of Technology.

HATCH, KEITH W. (1967) Assoc. Prof. Emeritus of Agricultural Education. BS 1959, MS 1971 Utah State University.

HATCH, MARGARET ELAINE B. (1962, 1967) Asst. Prof. Emeritus of University Extension. BS 1957 Brigham Young University, MS 1959 State University of Iowa.

HATCH, TERRANCE E. (1954) Assoc. Dean Emeritus for Extension and Field Services, College of Education; Prof. Emeritus of Secondary Education. BS 1943, MS 1949 Utah State University, EdD 1954 University of California (Los Angeles).

***HAWS, B. AUSTIN** (1957) Prof. Emeritus of Biology. BS 1948, MS 1949 Utah State University, PhD 1955 Iowa State University.

HAYCOCK, RICHARD C. (1969) Assoc. Dean Emeritus of College of Humanities, Arts and Social Sciences; Asst. Prof. Emeritus of Political Science. BS 1967, MS 1969 Utah State University, PhD 1976 University of Utah.

HEDIN, DUANE E. (1969) Asst. Prof. Emeritus of Instructional Technology. BS 1966 Weber State College, MS 1968, EdS 1969 Indiana University.

HELLBERG, RAY W. (1972) Prof. Emeritus of Art. BA 1955, MA 1962 Brigham Young University, EdD 1970 Pennsylvania State University.

HENDERSON, FLORIS S. (1959) Assoc. Prof. Emeritus of Business Education and Administrative Systems. BS 1944 University of Utah, MS 1952 Utah State University.

HENDERSON, HYRUM S. (1972) Assoc. Prof. Emeritus of Special Education. BS 1952 Ricks College, MEd 1959, EdD 1966 Brigham Young University.

HIGBEE, ARTHUR L. (1958) Prof. Emeritus of Merrill Library and Learning Resources Program, University Extension, and Communication. BS 1948, MS 1965 Utah State University, PhD 1970 Michigan State University.

HILL, GEOFFREY E. (1972) Research Prof. Emeritus of Utah Water Research Laboratory. BS 1954, MS 1959 Massachusetts Institute of Technology, PhD 1973 Pennsylvania State University.

HILL, LEON M. (1957) Asst. Prof. Emeritus of Industrial Technology and Education. BS 1952, MS 1966 Utah State University.

HIMES, ELLVERT H. (1954) Prof. Emeritus of Secondary Education; Emeritus Director of Summer School. BS 1931 University of Utah, MA 1937 University of Kansas, PhD 1950 University of Utah.

HORNE, RALPH H. (1963) Assoc. Prof. Emeritus of University Extension. BS 1950 Utah State University, MS 1966 Colorado State University.

HOWELL, BARBARA ANN B. (1962) Asst. Prof. Emeritus of Elementary Education. BS 1946, MS 1964 Utah State University.

HUBER, THELMA (1931) Prof. Emeritus of University Extension. BS 1925 University of Utah, MS 1931 Utah State University.

HUNSAKER, LLOYD R. (1936) Prof. Emeritus of Dairy Science; Assoc. Director Emeritus of University Extension. BS 1935 Utah State University, MS 1948, PhD 1957 University of Minnesota.

HURST, CLYDE (1940) Instr. Emeritus of Industrial and Technical Education.

HURST, REX L. (1952) Prof. Emeritus of Mathematics and Statistics, Computer Science. BS 1948, MS 1950 Utah State University, PhD 1952 Cornell University.

ISRAELSEN, C. EARL (1959) Prof. Emeritus of Civil and Environmental Engineering and Utah Water Research Laboratory. BS 1959, MS 1967 Utah State University, PhD 1968 University of Arizona.

JACKSON, ARTHUR D. (1958) Prof. Emeritus of Elementary Education. BS 1943 Colorado College, MS 1949 Utah State University, EdD 1970 University of Arizona.

JAMES, DAVID W. (1969) Prof. Emeritus of Plants, Soils, and Biometeorology. BS 1956, MS 1957 Utah State University, PhD 1962 Oregon State University.

JENSEN, IDA MARIE C. (1947) Assoc. Prof. Emeritus of Merrill Library and Learning Resources Program. BS 1938, MS 1956 Utah State University, MALS 1960 University of Denver.

JENSEN, JAY R. (1963) Prof. Emeritus of Communicative Disorders. BS 1951, MS 1957 University of Utah, PhD 1960 University of Wisconsin.

JENSEN, LOUIS A. (1946) Assoc. Prof. Emeritus of Plant Science. BS 1939, MS 1960 Utah State University.

JOHNSON, L. GAIL (1964) Prof. Emeritus of Elementary Education. BS 1954 Utah State University, MEd 1962, EdD 1964 University of Oregon.

***JOHNSON, MILDRED JANE** (1977) Assoc. Prof. Emeritus of Music. BM 1944, MM 1948 Westminster Choir College (Princeton), PhD 1953 University of Indiana.

JOHNSON, RALPH M., Jr. (1968) Dean Emeritus of College of Science; Prof. Emeritus of Chemistry and Biochemistry. BS 1940 Utah State University, MS 1944, PhD 1948 University of Wisconsin.

JOHNSON, THETA F. (1943) Assoc. Prof. Emeritus of Home Economics; Consumer Education Specialist Emeritus, University Extension. BS 1938 Utah State University, MA 1953 Columbia University.

JONES, IVAN BLAINE (1966) Asst. Prof. Emeritus of University Extension. BS 1958 Brigham Young University, MS 1974 Utah State University.

JONES, LEWIS W. (1937) Prof. Emeritus of Bacteriology. BS 1936, MS 1937 Utah State University, PhD 1953 Stanford University.

JONES, NORMAN B. (1962) Prof. Emeritus of Civil and Environmental Engineering; Environmental Engineer, University Extension. BS 1949 Utah State University, MS 1951 University of California (Berkeley).

JONES, WILLIAM L. (1946) Prof. Emeritus of Electrical Engineering and Space Dynamics Laboratories. BS 1944 University of Illinois, MS 1949 Utah State University, DEngr 1956 Stanford University, PhD 1967 University of Utah.

JURINAK, JEROME J. (1967) Prof. Emeritus of Plants, Soils, and Biometeorology. BS 1951 Colorado State University, MS 1954, PhD 1956 Utah State University.

KARTCHNER, EUGENE C. (1965) Prof. Emeritus of Business Administration and Computer Science. BS 1951 University of Colorado, MBA 1956 University of Utah, PhD 1965 University of Washington.

KEARL, LEONARD C. (1969) Research Asst. Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1938, MS 1969 Utah State University.

KELLER, GORDON N. (1962) Prof. Emeritus of Sociology, Social Work and Anthropology. BA 1941 University of Utah, MA 1949, PhD 1961 University of Chicago.

KELLER, JACK (1960) Prof. Emeritus of Agricultural and Irrigation Engineering; Coordinator, USAID/CID/USU Water Management Synthesis II, International Programs. BS 1953, MS 1955 Colorado State University, PhD 1967 Utah State University, PE.

KIEFER, FRED W., Jr. (1955) Prof. Emeritus of Civil and Environmental Engineering. BS 1950 Utah State University, MS 1953 Colorado State University, PhD 1968 University of California (Berkeley), PE.

KOTTER, CLEON M. (1958) Assoc. Prof. and Agricultural Information Specialist Emeritus of University Extension. BS 1954, MA 1965 Brigham Young University.

KULKARNI, H.B. (1967) Prof. Emeritus of English. BA 1937, MA 1939 Bombay University, India, PhD 1962 University of Utah.

LAMBORN, REUEL E. (1946) Research Asst. Prof. Emeritus of Soil Science and Biometeorology. BS 1941, MS 1950, PhD 1975 Utah State University.

LARSEN, PAUL B. (1948) Assoc. Prof. Emeritus of Nutrition and Food Sciences. BS 1938 Utah State University, MS 1940 Michigan State University.

LARSEN, R. PAUL (1982) Vice President Emeritus for University Extension and Continuing Education; Prof. Emeritus of Plants, Soils, and Biometeorology. BS 1950 Utah State University, MS 1951 Kansas State University, PhD 1955 Michigan State University.

LARSON, IDELLA B. (1967) Asst. Prof. Emeritus of English. BA 1966, MA 1967 Utah State University.

LARSON, JESSIE (1941) Prof. Emeritus of Art. BS 1933 Utah State University, MFA 1948 University of Washington.

LATHAM, GLENN I. (1974) Prof. Emeritus of Special Education and Rehabilitation. BS 1960, MS 1965 University of Utah, EdD 1971 Utah State University.

***LeBARON, ALLEN D.** (1963) Prof. Emeritus of Economics; Research Associate, USAID/CID/USU Water Management Synthesis II, International Programs. BS 1956 University of Utah, PhD 1962 University of London.

LEMON, BESSIE K. (1938) Assoc. Prof. Emeritus of University Extension. BA 1933, MS 1961 Utah State University.

LEWIS, EVELYN HODGES (1938) Prof. Emeritus of Sociology and Social Work. BS 1929 Utah State University, MA 1939, ACSW 1955, Advanced Curriculum 1958 University of Chicago.

LEWIS, VIRGINIA STOLPE (1962) Assoc. Prof. Emeritus of Home Economics and Consumer Education. BS 1941 Utah State University, MS 1962 Oregon State University.

LIND, DON L. (1986) Prof. Emeritus of Physics. BS 1953 University of Utah, PhD 1964 University of California.

LINDSTROM, GAELL (1957) Prof. Emeritus of Art. BS 1952 University of Utah, MFA 1963 California College of Arts and Crafts.

LONG, GILBERT A. (1970) Prof. Emeritus of Agricultural Systems Technology and Education. BS 1956, MS 1963 Washington State University, PhD 1970 Ohio State University.

LOVELESS, AUSTIN G. (1952) Prof. Emeritus of Industrial Technology and Education. BS 1947 Utah State University, MS 1952 Oregon State College, EdD 1962 University of Missouri.

LOW, JESSOP B. (1943) Prof. Emeritus of Wildlife Science. BS 1937 Utah State University, MS 1939, PhD 1941 Iowa State University.

LOWE, CALVIN D. (1962) Prof. Emeritus of Business Administration. BS 1950 Utah State University, MA 1952 University of Utah, EdD 1963 Utah State University.

LYE, WILLIAM F. (1968) Prof. Emeritus of History. BS 1959 Utah State University, MA 1959 University of California (Berkeley), PhD 1969 University of California (Los Angeles).

MARSTON, GLENN F. (1954) Assoc. Prof. Emeritus of Economics, Management and Human Resources. BS 1951, MS 1953 University of Utah.

MATTHEWS, DARRELL H. (1948) Assoc. Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1948, MS 1958 Utah State University.

MATTHEWS, DOYLE J. (1951) Dean Emeritus of College of Agriculture; Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1950, MS 1951 Utah State University, PhD 1959 Kansas State University.

MATTHEWS, VERL BAXTER (1968) Ext. Assoc. Prof. Emeritus of University Extension. BS 1962, MS 1965 Brigham Young University.

MAUGHAN, WESLEY T. (1965) Prof. Emeritus of Sociology, Social Work and Anthropology. BS 1951 Utah State University, MS 1962, PhD 1964 University of Wisconsin.

McADAMS, ROBERT E. (1965) Assoc. Prof. Emeritus of Physics. BS 1957 Colorado State University, PhD 1964 Iowa State University.

McALLISTER, DEVERE R. (1950) Prof. Emeritus of Plant Science. BS 1939, MS 1948 Utah State University, PhD 1950 Iowa State University.

McCLELLAN, LINCOLN H. (1956) Assoc. Prof. Emeritus of Health, Physical Education and Recreation. BS 1937 Utah State University, MS 1942, EdD 1963 University of Oregon.

MEGILL, LAWRENCE REX (1968) Prof. Emeritus of Physics, Electrical Engineering, and Center for Atmospheric and Space Sciences. BS 1949, MA 1951 University of Nebraska, PhD 1959 University of Colorado.

MENDINI, ARTHUR H. (1955) Assoc. Prof. Emeritus of Health, Physical Education and Recreation. BS 1952, MS 1959 Utah State University.

MERKLEY, MARGARET B. (1947) Prof. Emeritus of Nutrition and Food Sciences and University Extension. BS 1931 Brigham Young University, BS 1951, MS 1952 Utah State University, PhD 1960 Texas Women's University.

MERRILL, SAMUEL W. (1956) Assoc. Prof. Emeritus of Industrial Technology. BS 1942, MS 1966 Utah State University.

MICHAELSEN, LEON C. (1949) Prof. Emeritus of University Extension. BS 1937 Utah State University, MS 1939 Montana State University, EdD 1967 Cornell University.

MICKELSEN, CHARLES H. (1951) Assoc. Prof. Emeritus of Animal, Dairy and Veterinary Sciences; Ext. Dairyman, University Extension. BS 1951, MS 1963 Utah State University.

MILLER, AKELEY (1960) Assoc. Prof. Emeritus of Physics. BA 1950, MA 1952 University of South Dakota, PhD 1960 University of Missouri.

MILLER, GENE W. (1957, 1974) Prof. Emeritus of Biology. BS 1950, MS 1954 Utah State University, PhD 1957 North Carolina State University.

MILLER, RAYMOND W. (1956) Prof. Emeritus of Plants, Soils, and Biometeorology. BS 1952, MS 1953 University of Arizona, PhD 1956 Washington State University.

MINER, MERTHYR L. (1943) Prof. Emeritus of Veterinary Science. BS 1937 Utah State University, DVM 1941 Iowa State University.

MOORE, WILLIAM M. (1960) Prof. Emeritus of Chemistry and Biochemistry. BA 1952 Colorado College, PhD 1959 Iowa State University.

MORGAN, FLOYD T. (1934) Prof. Emeritus of Theatre Arts. BS 1934 Utah State University, MA 1939 State University of Iowa.

MORTENSEN, J. LYNN (1950) Prof. Emeritus of English. BS 1949, MS 1950 Utah State University.

MORTIMER, WILLIAM E. (1943) Prof. Emeritus of Industrial and Technical Education. BS 1928 Brigham Young University, MS 1942 Oregon State College, EdD 1956 University of Missouri.

MUSTONEN, KARLO K. (1963) Senior Librarian Emeritus of Merrill Library and Learning Resources Program. BS 1958 Utah State University, MALS 1964 University of Minnesota.

NELSON, DALE O. (1947) Prof. Emeritus of Health, Physical Education and Recreation. BS 1942, MS 1948 Utah State University, PhD 1956 University of Southern California.

NELSON, MARY (1948) Assoc. Prof. Emeritus of Mathematics. BA 1933 Utah State University, MS 1938 State University of Iowa.

NEUHOLD, JOHN M. (1958) Prof. Emeritus of Fisheries and Wildlife. BS 1952, MS 1954, PhD 1959 Utah State University.

NIELSEN, ELWIN C. (1969) Assoc. Prof. Emeritus of Psychology. BS 1958, MA 1961, PhD 1963 University of Utah.

NIELSEN, VENETA L. (1946) Prof. Emeritus of English. BS 1940, MS 1950 Utah State University.

NIELSON, REX F. (1949) Assoc. Prof. Emeritus of Soil Science and Biometeorology. BS 1947, MS 1949 Utah State University.

OGDEN, MARVEN J. (1956) Assoc. Prof. Emeritus of University Extension. BS 1940, MS 1963 Utah State University.

PALFREYMAN, BERNICE (1944) Assoc. Prof. Emeritus of University Extension. BS 1940 Utah State University, MS 1968 Columbia State University.

PARKER, KARL G. (1963) Prof. Emeritus of Range Science and University Extension. BS 1938 Colorado State University, MS 1956 Montana State University.

PATRICK, JOHN M. (1957) Prof. Emeritus of English. BA 1942, MA 1947 Southwestern University (Texas), PhD 1956 Georgetown University.

PEARCE, JANICE (1957) Prof. Emeritus of Health, Physical Education and Recreation. BS 1952 University of Utah, MS 1957 Washington State University, PhD 1974 University of Utah.

PETERSON, CHARLES S. (1971) Prof. Emeritus of History. BA 1953, MA 1958 Brigham Young University, PhD 1967 University of Utah.

***PETERSON, EDWIN L.** (1937) Prof. Emeritus of History and Geography. BS 1937, MS 1941, PhD 1957 Utah State University.

PETERSON, HOWARD B. (1940) Prof. Emeritus of Agricultural and Irrigation Engineering. AB 1935, MA 1937 Brigham Young University, PhD 1940 University of Nebraska.

***PETERSON, RONALD SKEEN** (1959) Assoc. Prof. Emeritus of Psychology. BS 1952, MS 1961 Utah State University, DEd 1967 University of Oregon.

POLLARD, LEONARD H. (1939) Prof. Emeritus of Plant Science. BS 1932, MS 1934 Utah State University, PhD 1939 University of California (Davis).

POPE, SHIRLENE MASON (1970) Asst. Prof. Emeritus of English. BA 1954, MA 1970 Idaho State University, PhD 1974 University of Utah.

POPE, WENDELL L. (1959) Prof. Emeritus of Computer Science. BS 1956 Utah State University, MS 1958 Stanford University, MS 1968 University of Wisconsin.

PORTER, GORDON E. (1947) Assoc. Prof. Emeritus of Languages and Philosophy. BS 1943 Utah State University.

POST, FREDERICK J. (1965) Prof. Emeritus of Biology. BS 1952 University of California (Berkeley), MS 1953, PhD 1958 Michigan State University.

POUND, EARL F. (1970) Research Assoc. Prof. Emeritus of Electrical Engineering and Center for Space Engineering. BSEE 1952, MSEE 1955 University of Utah.

POWERS, RICHARD B. (1969) Prof. Emeritus of Psychology. BA 1959, MA 1962 California State College (Los Angeles), PhD 1967 Arizona State University.

PRATER, BARBARA MATHIS (1974) Assoc. Prof. Emeritus of Nutrition and Food Sciences. BS 1944, MS 1964, PhD 1980 University of Utah.

PUBLICOVER, PHYLLIS (1963) Assoc. Prof. Emeritus of Special Education. BA 1941 Wellesley College, MS 1954 Utah State University, PhD 1975 University of Missouri.

PUGMIRE, DOROTHY JEAN (1956) Prof. Emeritus of Elementary Education. BS 1948 Utah State University, AM 1951 University of Michigan, EdD 1973 University of Maryland.

RASMUSSEN, H. DALE (1957) Assoc. Prof. Emeritus of Health, Physical Education and Recreation. BS 1949, MS 1956 Utah State University.

REESE, L. GRANT (1969) Prof. Emeritus of Languages and Philosophy. BS 1955, MS 1956 Utah State University, PhD 1962 University of Washington.

RICE, MOYLE Q. (1937) Prof. Emeritus of English. BS 1936 Utah State University, MA 1937 University of Nebraska.

RICE, RUTH J. (1969) Asst. Prof. Emeritus of Merrill Library and Learning Resources Program. BS 1965, MEd 1973 Utah State University.

RICH, ELLIOT (1956) Prof. Emeritus of Civil and Environmental Engineering. BS 1943 Utah State University, MS 1951 University of Utah, PhD 1968 University of Colorado, PE, Licensed Land Surveyor.

RICH, WAYNE R. (1955) Assoc. Prof. Emeritus of Mathematics and Statistics. BS 1948, MS 1949 Utah State University.

RICHARDSON, GARY HAIGHT (1967) Prof. Emeritus of Nutrition and Food Sciences, Biology. BS 1953 Utah State University, PhD 1960 University of Wisconsin.

RICKERT, DEVOE C. (1966) Assoc. Prof. Emeritus of Special Education. BA 1949 Southern Idaho College of Education, MS 1952 University of Idaho, EdD 1966 University of Oregon.

***RILEY, JOHN PAUL** (1967) Prof. Emeritus of Civil and Environmental Engineering, Biological and Irrigation Engineering, and Utah Water Research Laboratory. BASc 1950 University of British Columbia, CE 1953, PhD 1967 Utah State University, PE.

***RINGER, WAYNE B.** (1958) Prof. Emeritus of University Extension and Agricultural and Irrigation Engineering. BS 1951, MS 1963 Utah State University, PhD 1968 University of Chicago.

ROBERTS, N. KEITH (1957) Prof. Emeritus of Economics. BS 1948, MS 1949 Iowa State College, PhD 1958 University of Kentucky.

ROBERTS, REED S. (1960) Prof. Emeritus of Biology. BS 1942, MS 1948 Utah State University.

ROBINSON, REX E. (1946) Prof. Emeritus of Communication. BS 1931 Oregon State University, MS 1933 State University of Iowa, PhD 1947 University of Wisconsin.

ROSE, D. WAYNE (1952) Prof. Emeritus of University Extension. BS 1952 Utah State University, MS 1959 University of Minnesota, PhD 1971 University of Utah.

***SALUNKHE, D. K.** (1954) Prof. Emeritus of Nutrition and Food Sciences. BS 1949 Pona University, India, MS 1950, PhD 1953 Michigan State University.

SANDERS, RAYMOND T. (1959) Prof. Emeritus of Biology. BS 1949, MS 1950 University of Utah, PhD 1956 Stanford University.

SCHERTING, JOHN A. (1969) Assoc. Prof. Emeritus of English. BA 1960 Central Washington State College, PhD 1970 Washington State University.

SHAW, G. MERRILL (1939) Prof. Emeritus of Industrial Technology and Education. BS 1940, MS 1951 Utah State University, EdD 1973 Brigham Young University, PE.

SHAW, RICHARD J. (1950) Prof. Emeritus of Biology. BS 1947, MS 1950 Utah State University, PhD 1961 Claremont Graduate School.

SHUPE, JAMES LEGRANDE (1966) Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1948 Utah State University, DVM 1952 Cornell University.

SHUPE, OWEN K. (1961) Prof. Emeritus of Mechanical and Aerospace Engineering. AA 1947 Weber State College, MEngr 1952 Colorado School of Mines, PhD 1959 University of Utah.

SIMMONS, JOHN R. (1961) Prof. Emeritus of Biology. BS 1955, MS 1957 Utah State University, PhD 1960 California Institute of Technology.

SJOBLOM, WALLACE D. (1952) Assoc. Prof. Emeritus of University Extension. BS 1952 Utah State University, MEd 1963 Colorado State University.

SKABELUND, DEAN O. (1961) Assoc. Prof. Emeritus of English. BS 1957, MS 1959 Utah State University.

SKIDMORE, C. JAY (1950) Prof. Emeritus of Family and Human Development. BS 1943, MS 1944 University of Utah, EdD 1949 Columbia University.

SKUJINS, JOHN J. (1969) Prof. Emeritus of Soil Science and Biometeorology, Biology. AB 1957, PhD 1963 University of California (Berkeley).

SMITH, ALBERT BENJAMIN (1952) Asst. Prof. Emeritus of Mechanical Engineering. BS 1951 Utah State University, MEngr 1962 Texas A&M University.

SMITH, ALICE C. (1950) Asst. Prof. Emeritus of Sociology, Social Work and Anthropology. BS 1934 Columbia University, MS 1951 Utah State University.

SMITH, ANNA MARIE (1948) Asst. Prof. Emeritus of Library Science. BA 1928 Park College, BSLS 1947 University of Denver.

***SMITH, GRANT GILL** (1961) Prof. Emeritus of Chemistry and Biochemistry; Director, International Office of Water Education. BA 1943 University of Utah, PhD 1949 University of Minnesota.

SMITH, HUBERT W. (1947) Prof. Emeritus of English. AB 1928 Park College, MS 1933 Northwestern University, PhD 1949 University of Pennsylvania.

SMITH, R.L. (1955) Prof. Emeritus of Soil Science and Biometeorology. BS 1951, MS 1952 Utah State University, PhD 1955 University of California (Los Angeles).

SMITH, RICHARD L. (1976) Prof. Emeritus of Business Administration, Management and Human Resources. BS 1946 University of Utah, MBA 1947 Northwestern University, DCS 1955 Harvard University.

SMITH, RONALD W. (1965) Assoc. Prof. Emeritus of English. BA 1963 Hunter College (City University of New York), MA 1965 University of Wyoming.

SMITH, WILLIAM LLOYD (1954) Assoc. Prof. Emeritus of University Extension. BS 1954 Ricks College, MS 1955 Utah State University.

SMITH, WINSLOW WHITNEY (1946) Prof. Emeritus of Bacteriology and Public Health. BA 1933, MA 1936 University of Utah, PhD 1939 University of Wisconsin.

***SOMERS, W. KARL** (1946) Prof. Emeritus of Mechanical Engineering. BS 1948, MS 1960 Utah State University, CME.

SORENSON, EVAN J. (1955) Asst. Prof. Emeritus of Health, Physical Education and Recreation. BS 1947, MS 1954 Utah State University.

SOUTHARD, ALVIN R. (1967) Prof. Emeritus of Soil Science and Biometeorology. BS 1957, MS 1958 Utah State University, PhD 1963 Cornell University.

SPEAR, CARL D. (1966) Prof. Emeritus of Mechanical and Aerospace Engineering. BS 1955, PhD 1960 University of Utah.

SPENCE, JACK T. (1958) Prof. Emeritus of Chemistry and Biochemistry. BS 1951, PhD 1957 University of Utah.

STANLEY, HUGH P. (1966) Prof. Emeritus of Biology. BA 1951 University of California (Berkeley), MA 1958, PhD 1961 Oregon State University.

STEVENS, VELYN BAYLES (1945) Prof. Emeritus of University Extension. BS 1926 Brigham Young University.

STEWART, JOHN J. (1947) Prof. Emeritus of English. BS 1949 Utah State University, MS 1957 University of Oregon.

STOKER, GOLDEN L. (1945) Assoc. Prof. Emeritus of Plant Science. BS 1932, MS 1933 Utah State University.

STOKES, ALLEN W. (1952) Prof. Emeritus of Wildlife Science. BS 1936 Haverford College, MA 1942 Harvard University, PhD 1952 University of Wisconsin.

STONE, DAVID R. (1946) Prof. Emeritus of Psychology. BA 1943, MA 1943 University of Utah, PhD 1946 University of Chicago.

STRINGHAM, GLEN E. (1965) Prof. Emeritus of Agricultural and Irrigation Engineering. BS 1955 Utah State University, PhD 1966 Colorado State University.

STUTLER, R. KERN (1970) Research Asst. Prof. Emeritus of Biological and Irrigation Engineering. BS 1957 Colorado State University, MS 1970 Utah State University.

SUMMERS, LOWELL P. (1946) Assoc. Prof. Emeritus of Industrial Technology and Education. BS 1940, MS 1956 Utah State University.

SUPRUNOWICZ, KONRAD (1961) Prof. Emeritus of Mathematics. BS 1952, MA 1953, PhD 1960 University of Nebraska.

SUPRUNOWICZ, VALENTINE (1961) Asst. Prof. Emeritus of Languages and Philosophy. Cand. Phil. 1951 Christian Aralbrecht University in Kiel, MA 1955 University of Nebraska.

SWENSON, DAN H. (1948) Asst. Prof. Emeritus of Merrill Library and Learning Resources Program. BS 1940, MS 1949 Utah State University.

SWENSON, RICHARD M. (1971) Vice Provost Emeritus; Prof. Emeritus of Soil Science and Biometeorology. BS 1946 Brigham Young University, MS 1948 University of Massachusetts, PhD 1951 Iowa State University.

SWINDLE, KARMA P. (1946) Assoc. Prof. Emeritus of University Extension. BS 1929 Brigham Young University.

TAGGART, GLEN L. (1968) President Emeritus of Utah State University; Prof. Emeritus of Sociology, Social Work and Anthropology. BS 1940 Utah State University. PhD 1946 University of Wisconsin.

TAYLOR, FRANCES G. (1969) Asst. Prof. Emeritus of Nutrition and Food Sciences. BS 1941, MS 1970 Utah State University.

TAYLOR, MORRIS H. (1945) Prof. Emeritus of Economics and University Extension. BS 1937 Utah State University. MS 1938, PhD 1958 University of Wisconsin.

TAYLOR, WALLACE REED (1977) Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1952, MS 1955 University of Idaho, PhD 1977 Iowa State University.

TEZAK, WILLIAM V. (1955) Assoc. Prof. Emeritus of Accounting. AB 1947 Western State College of Colorado, MBA 1948 University of Denver.

THACKERAY, HELEN (1970) Assoc. Prof. Emeritus of Home Economics and Consumer Education and University Extension. BS 1934 University of Utah, MBA 1942 Washington State University, MA 1945 Teachers College at Columbia University.

THAIN, ALDYTH MARY (1946) Prof. Emeritus of Languages. BS 1919 Utah State University. MA 1930 University of Southern California.

THOMAS, DON W. (1954) Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1949 Utah State University, DVM 1953 Iowa State University.

THOMAS, JAMES ALAN (1952) Assoc. Prof. Emeritus of Animal, Dairy and Veterinary Sciences. DVM 1946 Colorado State University.

THOMPSON, IRENE GIDDINGS (1963) Asst. Prof. Emeritus of University Extension. BS 1940, MS 1963 Brigham Young University.

***THORNE, ALISON C.** (1964) Prof. Emeritus of Home Economics and Consumer Education and Sociology, Social Work, and Anthropology. BS 1934 Brigham Young University, MS 1935, PhD 1938 Iowa State University.

TINGEY, WILLIS A. (1946) Asst. Prof. Emeritus of Civil and Irrigation Engineering. BS 1928 Utah State University.

***TIPPETTS, TWAIN C.** (1956) Prof. Emeritus of Art. BS 1939, MA 1941 Brigham Young University, EdD 1960 University of California (Los Angeles).

URNESS, PHILIP J. (1983) Prof. Emeritus of Rangeland Resources. BS 1958, MS 1960 Washington State University, PhD 1966 Oregon State University.

VAN EPPS, GORDON A. (1952) Assoc. Prof. Emeritus of Plant Science and Range Science. BS 1942, MS 1948 Utah State University.

VAN ORDEN, HARRIS O. (1946) Prof. Emeritus of Chemistry and Biochemistry. BS 1938 Utah State University, MS 1942 Washington State University, PhD 1951 Massachusetts Institute of Technology.

WADSWORTH, NELSON B. (1983) Prof. Emeritus of Communication. BS 1954 San Jose State College, MS 1970 University of Utah.

WALKER, DAVID R. (1960) Prof. Emeritus of Plants, Soils, and Biometeorology. BS 1951, MS 1952 Utah State University, PhD 1955 Cornell University.

WALLIS, CARL R. (1957) Assoc. Prof. Emeritus of Industrial and Technical Education. BS 1949, MS 1957 Utah State University, EdD 1968 Arizona State University.

WAMSLEY, HELEN J. (1946) Asst. Prof. Emeritus of University Extension. BS 1937 Utah State University.

WARDLE, ALVIN (1959) Prof. Emeritus of Music. BA 1951 Brigham Young University, MEd 1955 Utah State University, PhD 1969 Florida State University.

WARNICK, ROBERT E. (1960) Research Asst. Prof. Emeritus of Animal, Dairy and Veterinary Sciences. BS 1955 Brigham Young University, MS 1963, PhD 1970 Utah State University.

WASHINGTON, EUGENE H. (1969) Prof. Emeritus of English. AB 1960, PhD 1969 University of Missouri.

WASSERMANN, IRVING (1955) Prof. Emeritus of Music; Pianist, Artist-in-Residence. BS 1936, JD 1937 University of Cracov, Poland.

WATKINS, BRUCE O. (1953) Prof. Emeritus of Electrical Engineering. BSEE 1934 University of Arizona, MSEE 1947 University of Missouri, PhD 1954 University of Minnesota, PE.

WATKINS, REYNOLD K. (1947) Prof. Emeritus of Civil and Environmental Engineering. BS 1944 University of Utah, MS 1947 Massachusetts Institute of Technology, PhD 1957 Iowa State University, PE, Licensed Land Surveyor.

WATSON, JAMES D. (1967) Assoc. Prof. Emeritus of Mathematics. BA 1954 Bemidji State College, MA 1960 University of Minnesota, PhD 1967 Iowa State University.

WHITE, DAVID (1965) Prof. Emeritus of Applied Statistics. BA 1951, MS 1957 Brigham Young University, PhD 1964 Oklahoma State University.

WIGGINS, EVELYN L. (1956) Asst. Prof. Emeritus of Elementary Education. BS 1947, MS 1959 Utah State University.

WILLARDSON, LYMAN S. (1974) Prof. Emeritus of Biological and Irrigation Engineering. BS 1950, MS 1955 Utah State University, PhD 1967 Ohio State University.

WILLEY, LYNN R. (1946) Assoc. Prof. Emeritus of Industrial Technology. Trade Certificate 1939, BS 1950, MS 1953 Utah State University, EdD 1975 Florida State University.

WOOD, JOHN K. (1956) Prof. Emeritus of Physics. BS 1941 Utah State University, MS 1942, PhD 1946 Pennsylvania State University.

***WOOLDRIDGE, GENE LYSLE** (1970) Prof. Emeritus of Soil Science and Biometeorology. BS 1944 Upper Iowa College, MS 1961 Mankato State College, PhD 1970 Colorado State University.

WORKMAN, GAR W. (1966) Assoc. Prof. Emeritus of Fisheries and Wildlife. BS 1957, MS 1959, PhD 1963 Utah State University.

WYATT, CLAIR L. (1959) Prof. Emeritus of Electrical Engineering. BS 1955, MS 1962, PhD 1968 Utah State University.

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*Has current assignment with University.

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Agricultural Irrigation River Lab, 1700 East Canyon Rd.
Animal Husbandry Experiment Farm, 3580 S. Highway 89-91
Dairy Center (George B. Caine), 4300 S. Highway 89-91
Drainage Experiment Farm, West Logan
Evans Experiment Farm, Nibley
Greenville Farm, 1800 N. 800 E.
Historical Farm (Ronald V. Jensen), 4025 S. Highway 89-91
Horse Arena, 1550 N. 600 E.
Lyric Theatre, 28 W. Center St.
Navajo Sheep Project, 1600 E. 3200 N.
Research & Technology Park, 1780 Research Pky (500 E. 1780 N.)
Richmond Experiment Farm, Richmond
Skaggs (L.S.) Animal Nutrition Bldg, 1541 N. 800 E.
USU Research Foundation, 1747 N. Research Pkwy (500 E. 1800 N.)
  Utah Research Institute
Utah Water Research Lab (George D. Clyde), 1600 E. Canyon Rd.

Buildings by Number

1. Main (B-15)
3. Information News Services (A-14)
4. Alumni Center (David B. Haight) (A-14)
6. Heating Plant (A-14)
8. Family Life Center (A-15)
10. Education Building (Emma Eccles Jones) (C-12)
12C. Lundberg Building (B-16)
13. Ray B. West Building (B-15)
14. Spectrum (Dee Glen Smith) (B-10)
15. Health, Physical Education and Recreation (B-11)
16. Family Life Building (B-15)
17. Stadium (E.L. "Dick" Romney) (C-7)
17P. Track Stadium (Ralph Maughan) (C-5)
18. Geology Building (C-14)
19. Animal Science Building (B-14)
20. Vocational Horticulture (B-3)
21. Widtsoe (John A.) Hall (Chemistry) (B-14)
21A. Chemistry/Biochemistry Lab (Sherwin Maeser) (B-14)
22. Student Center (Glen L. Taggart) (B-13)
23. Recreation Center (George Nelson) (B-12)
24. Industrial Science Bldg (D-12)
25. Military and Aerospace Sciences Bldg (B-12)
26. Amphitheatre (A-16)
28. Eccles Conference Center (C-14)
28A. University Inn (B-13)
28B. Parking Terrace (B-12)
29. Observatory (C-6)
30. Athletics Center (Jay Dee/Alice Harris) (B-10)
31. The Barn (C-12)
32. Distribution/Vending (C-7)
33. Veterinary Science and Bacteriology (C-12)
35. Parking and Transportation Services (B-12)
36. Campus Services (C-12)
37. Communicative Disorders, USU Police (C-12)
39. Center for Persons with Disabilities (C-11)
39A. CPD Annex 1 (C-11)
39B. CPD Annex 2 (C-11)
40. University Press & Scholarly Publications (B-9)
41. Children's House #2 (C-9)
42. Children's House #1 (B-9)
43. Heritage House (C-9)
44. Sports Medicine (Western Surgery Center) (C-5)
45. Technology Bldg (D-13)
46. Vehicle Storage/Physical Plant (F-10)
47. Receiving/Physical Plant (F-11)
48. Maintenance Bldg/Physical Plant (F-11)
49. Grounds Maintenance Bldg/Physical Plant (F-11)
52. Nutrition and Food Sciences Bldg (C.A. Ernstrom) (F-11)
53. Agricultural Science (E.G. Peterson) (C-14)
54. Biotechnology Center (C-13)
55. Library, Science & Technology (C-14)
56. Business Bldg (George S. Eccles) (C-15)
57. Computer Center (C-14)
58. Biology Natural Resources (Quinney) (C-13)
58A. Natural Resources (S.J./J.E. Quinney) (C-13)
58B. Nat. Res. Research Library (Quinney) (C-13)
59. Agricultural Experiment Station (B-2)
59B. Greenhouse - USDA Bee Lab (B-2)
60A. Davis Hall (F-8)
60B. Jones Hall (F-8)
60C. Morgan Hall (F-8)
60D. Rich Hall (F-8)
60E. San Juan Hall (G-8)
60F. Summit Hall (G-8)
60G. Wasatch Hall (G-8)
60H. Lundstrom Hall (F-8)
60K. Uintah Hall (F-8)
61. University Reserve (E-12)
62. Science Engineering Research, (SER) Bldg (D-13)
63. CPD Special Projects (F-12)
64. Library (Milton R. Merrill) (C-15)
65. East Campus Office Building (F-12)
66. Lund Hall (Anthon H.) Hall (Math Dept.) (C-15)
67. Campus Planning & Engineering Bldg (E-12)
68A. Engineering Classroom Bldg (Dean F. Peterson) (D-14)
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73C. Art Sculpture Laboratory (E-13)
74. Forage and Range Research Lab, USDA (E-12)
75. Edith Bowen Laboratory School (C-12)
76. Richards (Le Grand) Hall (D-12)
77. Bullen (Herschel, Jr.) Hall (E-12)
78. Housing Office (E-12)
79. Multimedia and Distance Learning Services (E-11)
79A. Multimedia and Distance Learning Services Classroom (E-11)
82. Motor Pool and Storage (C-3)
89. Mobile Home Park (F-6)
90. Aggie Village (D-7)
90A. Aggie Village North (D-6)
93. Poisonous Plant Research Area (E-4)
98. West Stadium Villa (A-6)
104. The Junction (D-11)
105. Mountain View Tower (D-11)
106. Valley View Tower (D-11)
110. Meats and Physiology Lab (B-2)
116. Agricultural Systems Technology and Education (B-1)
117. Veterinary Diagnostics Lab (State of Utah) (D-3)
127. Technical Services (B-4)
128. Recycling Center (C-4)
129. Stores and Storage (B-4)
130. Campus Services and Storage/PDP (C-4)
174. Forestry Science Lab, USDA (F-10)
175. Forage Compound, USDA (B-3)
201. SKI*HI Institute (B-10)

CAMPUS MAP

1996

Utah State University

CAMPUS PLANNING AND ENGINEERING

Utah State
UNIVERSITY

High School/College Relations Office
Logan, Utah 84322-0160

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Logan, UT
84322-9900