1994

General Catalog 1994-1996

Utah State University

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1994-1996

Undergraduate Catalog

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

Telephone (801) 797-1129
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 within the University involve some risk and some may also involve travel. The University provides these classes 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 class or major may generate, and if they are not willing to assume the risks, they should not select that class or major. By voluntarily participating in these types of 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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## Contents

4 Calendar  
5 Utah State University and Mission Statement  
6 Degrees Offered at Utah State University  
8 Entering Utah State University  
8 Admissions and Records  
8 Admission Requirements  
11 Fees and Refunds  
13 Registration  
14 Records  
16 Graduation Requirements  
19 Course Numbering System  
19 Course Prefixes  
20 University Smoking Policy  
21 USU Written Communication and General Education Requirements  
28 Academic Service Offices  
28 Upper Division Requirements  
29 Special Programs  
29 Honors Program  
30 Applied Technology Education Programs  
30 Area Studies  
30 Exchange Programs  
31 Disability Resource Center  
31 General Registration  
31 Cooperative Education Internship Program  
32 Learning and Life Skills Center  
32 Reserve Officers Training Programs  
33 Special Certificate Programs  
33 Women's Studies  
34 Liberal Arts and Sciences Program  

### COLLEGES AND DEPARTMENTS

36 College of Agriculture  
38 College of Business  
41 College of Education  
42 College of Engineering  
47 College of Family Life  
48 College of Humanities, Arts and Social Sciences  
51 College of Natural Resources  
53 College of Science  
55 Accountancy, School of  
58 Aerospace Studies  
60 Agricultural Systems Technology and Education  
63 Animal, Dairy and Veterinary Sciences  
68 Art  
73 Biological and Irrigation Engineering  
76 Biology  
82 Business Administration  
85 Business Information Systems and Education  
89 Chemistry and Biochemistry  
92 Civil and Environmental Engineering  
97 Communication  
99 Communicative Disorders  
102 Computer Science  
106 Economics  
111 Electrical Engineering  
114 Elementary Education  
117 English  
121 Family and Human Development  
124 Fisheries and Wildlife  
127 Forest Resources  
130 Geography and Earth Resources  
132 Geology  
135 Health, Physical Education and Recreation  
143 History  
147 Human Environments  
151 Industrial Technology and Education  
157 Instructional Technology  
160 Intensive English Language Institute  
161 Landscape Architecture and Environmental Planning  
164 Languages and Philosophy  
170 Management and Human Resources  
173 Mathematics and Statistics  
177 Mechanical and Aerospace Engineering  
180 Military Science  
182 Music  
187 Nutrition and Food Sciences  
190 Physics  
193 Plants, Soils, and Biometeorology  
198 Political Science  
200 Psychology  
203 Range Science  
205 Secondary Education  
208 Sociology, Social Work and Anthropology  
215 Special Education  
219 Theatre Arts  
222 Watershed Science, Program in  
223 Cooperative Nursing Program  

### OTHER UNIVERSITY COMPONENTS

224 Learning Resources Program  
225 Summer Quarter  
226 Graduate Studies, School of  
226 Student Services  
227 Financial Aid and Scholarship Information  
242 Intercollegiate Athletics—Men and Women  
244 University Extension  
247 University Research  
252 International Programs and Studies  
254 University Relations and Development  
254 USU Development Office  
254 University Alumni Association  
254 Nora Eccles Harrison Museum of Art  
255 Utah Public Radio  
255 University Information News Services  
255 University Publications Editors  
256 Affirmative Action/Equal Opportunity Office  

### ADMINISTRATION AND FACULTY

257 Utah State Board of Regents  
257 USU Board of Trustees  
257 University Administration  
258 Colleges  
258 Departments of Instruction  
259 Student Services  
260 Faculty and Professional Staff  
303 Index
# Calendar

## 1994-95

### 1994 Fall Quarter
- **September 26-27**: New student orientation
- **September 28**: Classes begin
- **November 23-24, 25**: Thanksgiving break
- **December 5-9, 12, 13, 14, 15**: No-test days
- **December 9**: Last day of classes
- **December 11-12, 15**: Final examinations

### 1995 Winter Quarter
- **January 3**: Classes begin
- **January 16**: Holiday (Human Rights Day)
- **March 7-9, 10-13**: No-test days
- **March 13**: Last day of classes
- **March 14-16, 17**: Final examinations

### 1995 Spring Quarter
- **March 27**: Classes begin
- **May 29**: Holiday (Memorial Day)
- **June 2**: No-test days
- **June 3-5, 7**: Last day of classes
- **June 6-10**: Final examinations
- **June 11**: Graduation

### 1995 Summer Quarter
- **June 12-16**: Preession
- **June 19-23**: Preession
- **June 26**: Classes begin
- **July 4**: Holiday (Independence Day)
- **July 24**: Holiday (Pioneer Day)
- **August 18**: Quarter ends
- **August 21-25**: Postsession

## 1995-96

### 1995 Fall Quarter
- **September 25-26**: New student orientation
- **September 27**: Classes begin
- **November 22-23, 24**: Thanksgiving break
- **December 4, 5-8, 11-14**: No-test days
- **December 9**: Last day of classes
- **December 11-12**: Final examinations

### 1996 Winter Quarter
- **January 3**: Classes begin
- **January 15**: Holiday (Human Rights Day)
- **March 7-9, 10-13**: No-test days
- **March 12**: Last day of classes
- **March 13, 14, 15**: Final examinations

### 1996 Spring Quarter
- **March 25**: Classes begin
- **May 27**: Holiday (Memorial Day)
- **May 24, 28-30, 31**: No-test days
- **May 31**: Last day of classes
- **June 3, 4, 5, 6**: Final examinations
- **June 7**: Graduation

### 1996 Summer Quarter
- **June 10-14**: Preession
- **June 17-21**: Preession
- **June 24**: Classes begin
- **July 4**: Holiday (Independence Day)
- **July 24**: Holiday (Pioneer Day)
- **August 16**: Quarter ends
- **August 19-23**: Postsession
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 more than 18,000, 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.


**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

Economics
Agricultural Economics—BS, BA, MS, MA
Agribusiness—BS, BA
Agricultural Industries—MAI
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, MA, PhD
Ornamental Horticulture—One-year Certificate, Two-year Diploma, AAS

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

College of Business

Accountancy, School of
Accounting—BS, BA, MAccct

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, MEd
Office Systems Support—AAS
Marketing Education—BS, BA
Education—EdD, PhD

Economics
Economics—BS, BA, MS, MA, PhD
Social Science—MSS

Management and Human Resources
Human Resource Management—BS, BA
Management—BS, BA
Social Science—MSS

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

College of Education

Communicative Disorders
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
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, IE, ME, MS, PhD
Irrigation Science—MS

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

Electrical Engineering
Electrical Engineering—BS, MS, ME, MES, PhD
Degrees Offered

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

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

Interdisciplinary Engineering Program
Engineering—MS, ME, MES, PhD

College of Family Life

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

General Family Life
General Family Life—BS, BA

Human Environments
Apparel Merchandising—BS, BA
Home Economics Education—BS, BA
Interior Design—BS, BA
Human Environments—MS

Nutrition and Food Sciences
Nutrition and Food Sciences—BS, MS, 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 Science—MS

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 Science—MSS
Social Work—BS, BA
Anthropology—BS, BA

Theatre Arts
Theatre Arts—BA, BFA, MA, MFA
Interdisciplinary HASS and Science Program
Liberal Arts and Sciences—BA

College of Natural Resources

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

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

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

Range Science
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
Entering Utah State University

Admissions and Records

Assistant Vice President for Student Services: Lynn J. Poulsen
Director of Admissions: J. Rodney Clark
Registrar: Charles L. Olson
Associate Registrar: Elizabeth W. Allen
Assistant Registrar: Stanley A. Bodily

Offices in Taggart Student Center 246

The Office of Admissions and Records 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, Pass/D+, D, F adjustments, and issues verifications. See University Class Schedule for registration procedures.

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

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

5. Microfilm and I.D.: maintains microfilm records; issues student and faculty/staff I.D. 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 $25 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 below.) 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 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.

<table>
<thead>
<tr>
<th>Test Scores</th>
<th>GPA</th>
<th>SAT</th>
<th>ACT</th>
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<tr>
<td>GPA: 2.2</td>
<td>SAT: 1040</td>
<td>ACT: 16</td>
<td></td>
</tr>
</tbody>
</table>

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

A student who earns University credit concurrently with his or her senior year in high school will not be permitted to transfer this credit back to the high school in lieu of high school coursework. A principal of the high school can request the withdrawal of a student at any time, if the student is not doing satisfactory work in a University or high school course.

**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. 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 accepted 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.
Admission Requirements

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 $30 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) 797-1096. 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 80302-9752, 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 102G.

**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 1994-95

**UNDERGRADUATE STUDENTS**

<table>
<thead>
<tr>
<th>Credits</th>
<th>Utah Resident</th>
<th>Nonresident2</th>
<th>International Students3</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>313</td>
<td>960</td>
<td>985</td>
</tr>
<tr>
<td>7</td>
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<td>638</td>
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</tr>
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<tr>
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<tr>
<td>25</td>
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</table>

Note: Over 25 credits, additional tuition is $32 per credit hour for undergraduate residents.

Over 25 credits, additional tuition is $113 per credit hour for undergraduate nonresidents.

**GRADUATE STUDENTS**

<table>
<thead>
<tr>
<th>Credits</th>
<th>Utah Resident</th>
<th>Nonresident2</th>
<th>International Students3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</table>

Note: Over 25 credits, additional tuition is $35 per credit hour for graduate residents.

Over 25 credits, additional tuition is $124 per credit hour for graduate nonresidents.

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

Visitor fee (audit) ........................................... same as classes with credit
(except for persons 62 years of age or older who are permitted to audit fees 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 $129
3 credits—$203

Continuing Graduate Registration Fee ................ $10

1These fees are effective Fall Quarter 1994.
2Other U.S. citizens and immigrants
3Non-U.S. citizens and immigrants

Refund Policy

Carefully note the below refund policy:

Percent of Tuition to Refunded
Refund Period

Before Quarter Classes Begin ........................................ 100%
First 2 Days of the Quarter ...................................... 100%
3rd thru 7th Calendar Day ..................................... 90%
Thru the 14th Calendar Day .................................. 70%
Thru the 21st Calendar Day .................................. 50%
After the 21st Calendar Day ................................ 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 $25/30 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 Class Schedule to determine courses which require special fees.

Parked 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

Music Fee
Piano practice fees (one hour per day for the quarter) payable at Department .................. $20

Private instruction (per credit) payable at Department .................. variable fee

Division of General Registration Fee .................. $25 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 Class Schedule 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) .................. $25
Foreign Students (undergraduate) ............. $30

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 ........................................ $12
Master's Degrees ........................................... $15
Doctor of Philosophy or Education ............ $15

Teacher Placement Registration .................. $10

Transcript of Credits. The transcript fee (per transcript) is $3. 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 Class Schedule ($2.50), or Graduate Catalog ($3.00) phone Express-a-book at one of the following numbers: 1-(800) 662-3950, (801) 797-3950, 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. 227-241).
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 Class Schedule, 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 Class Schedule 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 changing the status of the class.

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 notation on the permanent record through the 30th day of classes. 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 drop date. An instructor’s signature is not required to drop courses. Students who fail to attend a 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, the student’s instructor and academic dean must approve any drop request and this may be done only upon a 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 permitted for the purpose of avoiding an unsatisfactory grade; neither shall I grades be given to avoid the consequences of inadequate performance. Appeals to the dean’s decision may be directed to the Provost’s Office.

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:

<table>
<thead>
<tr>
<th>Credit Hours Earned</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-44</td>
<td>Freshman</td>
</tr>
<tr>
<td>45-89</td>
<td>Sophomore</td>
</tr>
<tr>
<td>90-134</td>
<td>Junior</td>
</tr>
<tr>
<td>135 and over</td>
<td>Senior</td>
</tr>
</tbody>
</table>

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 is a federal law which (1) provides that eligible students will have access to and inspect 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. An eligible student is defined as any individual formally admitted to Utah State University or the parents of a dependent eligible student. 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 a party acting for the University. Two types of educational records are defined. 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 nonreleasable information) includes all information not defined as directory information and may not be released without consent of the student.

Student Access. Students have the right to review and inspect their educational records. The procedure students must follow to access their records is available in the Office of the Registrar. It is important to remember that, for educational purposes, University officials have access to student records.

Student Control of Directory Information. Students may control the release of this information by completing forms at the Office of the Registrar.

Releasable Information—Directory Information. The following guidelines are provided for release of information from student educational records:

- Student's name
- Local and Permanent Address
- Telephone number
- Date of birth
- Major field of study
- Residency Status
- Academic Level
- Department or College
- Participation in officially recognized activities or sports

Weight and height of members of athletic teams
Dates of attendance and graduation
Degrees and awards received
Most recent institution attended by the student
Current quarter schedule of classes

Nonreleasable Information. All other information.

Students accessing educational records or receiving University services must provide identification.

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-).

<table>
<thead>
<tr>
<th>Grade</th>
<th>Value</th>
</tr>
</thead>
<tbody>
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<td>A</td>
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<tr>
<td>A-</td>
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<td>3.33</td>
</tr>
<tr>
<td>B</td>
<td>3.00</td>
</tr>
<tr>
<td>B-</td>
<td>2.67</td>
</tr>
<tr>
<td>C</td>
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</tr>
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<td>C-</td>
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<tr>
<td>D</td>
<td>1.00</td>
</tr>
<tr>
<td>D-</td>
<td>0.00</td>
</tr>
</tbody>
</table>

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 grade 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 letter 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 D indicates academic achievement of not less than C-. All students, including freshmen, may take courses on a Pass/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 course work 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 course. 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. Any student who has repeated a USU course should promptly notify the Records Office. After receiving notification from the student, the student’s GPA can be recalculated. 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.

When a course listed in the Undergraduate Catalog has the symbol @ at the end of the course listing, it indicates that the same course may be taken more than once for credit. When this option is exercised, the repeat grade policy may apply upon the request of the student.

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. This policy does not apply to courses repeatable for credit.

The total number of repeats allowed is limited to ten. Students in violation of this limit will have an academic hold placed on their registration. Before the student can register again, the dean's signature must be obtained.

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 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 2.00 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.

   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 University discipline 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.
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.
11. Referral to psychological counseling or substance abuse office 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 approved 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 class schedule.

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 Agricultural Industries, Master of Business Administration, Master of Education, Master of Engineering, Master of Engineering Science, Master of Fine Arts, Master of Music, Master of Social Science, Master of Forestry, Master of Industrial Education, Master of Landscape Architecture, Master of Mathematics, Civil Engineer, Electrical Engineer, Irrigation 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, 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 Degree

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 language L 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 1 (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 21-28.)

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

¹USU 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.

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 3.95 to 4.000 GPA
- Magna Cum Laude 3.80 to 3.949 GPA
- Cum Laude 3.50 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 (pursuing concurrent degrees)

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. 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.

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1USU 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 sessions 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:


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:

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

**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 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 Class Schedule 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 class schedule or consult the course instructor or department head.

**Course Prefixes**

Acctg—Accounting

ADVS—Animal, Dairy and Veterinary Sciences

Agr—College of Agriculture

AgSat—Agriculture Satellite

Anthr—Anthropology (Sociology, Social Work and Anthropology Department)

Art—Art

AS—Aerospace Studies

ASTE—Agricultural Systems Technology and Education

BA—Business Administration

BIE—Biological and Irrigation Engineering

Biol—Biology

Bimt—Biometeorology (Plants, Soils, and Biometeorology Department)

BIS—Business Information Systems and Education

Bot—Botany (Biology Department)

CEE—Civil and Environmental Engineering

Chem—Chemistry and Biochemistry

Com D—Communicative Disorders
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 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 class schedules.

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 26. 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)
Honor 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.

2. Computer Literacy
   CS SK 150 BASIC Programming (4)
   CS SK 160 Elementary Computer Science, Algorithms, and Problem Solving (4)
   CS SK 170 Computer Sciences 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
   Int T SK 100
   Use of Libraries and Learning Resources (3)
   Honor SK 100H Library Literacy (2)
6. American Sign Language
   Com D 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 is required 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 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 23-24). Students should check their Major Requirement Sheet for specific requirements and consult with their Academic Adviser in their Department. Engineering students should see pages 27-28 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 credit distribution is different for each of the 4 Major Areas (see credit distribution tables 1 and 2 on page 23).

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 in-depth 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 25-26.)
   1. Beauty Cluster (23 credits)
   2. Civilization Cluster (27 credits)
   3. Science and Society Cluster (20 credits)
   4. Future Environments Cluster (27 credits)
   5. Matter and Spirit Cluster (under development)
   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
General Education Requirements

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, SS
   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), CSHU
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, SS
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)
(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 27-28.

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

Broadening Knowledge Requirement
Credit Distribution Table 1.

<table>
<thead>
<tr>
<th>Major Areas</th>
<th>HU</th>
<th>SS</th>
<th>LS</th>
<th>PS</th>
<th>IO</th>
<th>Total Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human. &amp; Arts</td>
<td>0-5*</td>
<td>0-6</td>
<td>5-16</td>
<td>5-16</td>
<td>0-9</td>
<td>30</td>
</tr>
<tr>
<td>Social Sc. (SS)</td>
<td>0-4</td>
<td>0-5*</td>
<td>5-16</td>
<td>5-16</td>
<td>0-9</td>
<td>30</td>
</tr>
<tr>
<td>Life Sc. (LS)</td>
<td>5-16</td>
<td>5-16</td>
<td>0-5*</td>
<td>0-6</td>
<td>0-9</td>
<td>30</td>
</tr>
<tr>
<td>Phys. Sc. (PS)</td>
<td>5-16</td>
<td>5-16</td>
<td>0-6*</td>
<td>0-5*</td>
<td>0-9</td>
<td>30</td>
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</tbody>
</table>

*Outside courses taught by the Major.

Colleges of Humanities, Arts and Social Sciences

Broadening Knowledge Requirement
Credit Distribution Table 2.

<table>
<thead>
<tr>
<th>Major Areas</th>
<th>HU</th>
<th>SS</th>
<th>LS</th>
<th>PS</th>
<th>IO</th>
<th>Total Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human. &amp; Arts</td>
<td>5*</td>
<td>6</td>
<td>5-14</td>
<td>5-14</td>
<td>0-9</td>
<td>30</td>
</tr>
<tr>
<td>Social Sc. (SS)</td>
<td>6</td>
<td>5*</td>
<td>5-14</td>
<td>5-14</td>
<td>0-9</td>
<td>30</td>
</tr>
</tbody>
</table>

*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. Com D HU 270  Language, Hearing, and Speech Development (5)
2. H Env HU 105  Design in Everyday Living (3) (or Art 101)
3. Art HU 101    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 (113H) Great Literature of Europe (3)
8. Engl HU 114 (114H) Great Literature of Britain (3)
9. Engl HU 115 (115H) Great Literature of America (3)
10. Engl HU 120 (120H) Great Books and Ideas (3)
11. Engl HU 121 (121H) Great Books and Ideas (3)
12. Engl HU 122 (122H) Great Books and Ideas (3)
13. Engl (Hist) HU 124 (124H) Introduction to Folklore (3)
### General Education Requirements

#### Social Sciences Courses (SS) Approved List

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Econ SS 200 (200H)</td>
<td>Economics I (5)</td>
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</tr>
<tr>
<td>2. Econ SS 201</td>
<td>Economics II (5)</td>
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</tr>
<tr>
<td>3. BA SS 135</td>
<td>Introduction to Business (3)</td>
<td></td>
</tr>
<tr>
<td>4. BIS SS 314</td>
<td>Managing Personal Finances (3)</td>
<td></td>
</tr>
<tr>
<td>5. MHR SS 311</td>
<td>Management and Organizations (4)</td>
<td></td>
</tr>
<tr>
<td>6. Psy SS 101</td>
<td>General Psychology (5)</td>
<td></td>
</tr>
<tr>
<td>7. Psy SS 110</td>
<td>Human Development: General (3-5)</td>
<td>(or FHD SS 150)</td>
</tr>
<tr>
<td>8. Psy SS 121</td>
<td>Psychology of Human Adjustment (3)</td>
<td></td>
</tr>
<tr>
<td>9. Psy SS 140</td>
<td>Analysis of Behavior: Basic Principles (4)</td>
<td></td>
</tr>
<tr>
<td>10. HFD SS 120</td>
<td>Marriage and the American Family (3)</td>
<td></td>
</tr>
<tr>
<td>11. HFD SS 150</td>
<td>Human Growth and Development (5)</td>
<td></td>
</tr>
<tr>
<td>12. FHD SS 304</td>
<td>Human Sexuality and Family Relations (3)</td>
<td></td>
</tr>
<tr>
<td>13. H Env SS 355</td>
<td>Family Finance (3)</td>
<td></td>
</tr>
<tr>
<td>14. Comm SS 121</td>
<td>The Consumer and the Market (3)</td>
<td>(or BIS SS 314)</td>
</tr>
<tr>
<td>15. Hist SS 104 (104H)</td>
<td>Introduction to Mass Communications (4)</td>
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</tr>
<tr>
<td>16. Hist SS 105 (105H)</td>
<td>Western Civilization: Modern (5)</td>
<td></td>
</tr>
<tr>
<td>17. Hist SS 170 (170H)</td>
<td>American Civilization (5)</td>
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</tr>
<tr>
<td>18. Spch SS 260</td>
<td>Interpersonal Communication (3)</td>
<td></td>
</tr>
<tr>
<td>20. PolSc SS 110</td>
<td>United States Government and Politics (5)</td>
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</tr>
<tr>
<td>21. PolSc SS 210 (210H)</td>
<td>Introduction to International Politics (5)</td>
<td></td>
</tr>
<tr>
<td>22. PolSc SS 220</td>
<td>Comparative Politics (5)</td>
<td></td>
</tr>
<tr>
<td>23. Soc SS 101</td>
<td>Introductory Sociology (5)</td>
<td></td>
</tr>
<tr>
<td>24. Soc (Anthr) SS 102</td>
<td>American Culture (3)</td>
<td></td>
</tr>
<tr>
<td>25. Soc SS 140</td>
<td>Modern Social Problems (3)</td>
<td>(or SW SS 105)</td>
</tr>
<tr>
<td>26. Anthr SS 101</td>
<td>Introduction to Anthropology (5)</td>
<td></td>
</tr>
<tr>
<td>27. Anthr SS 110</td>
<td>Human Origins (5)</td>
<td></td>
</tr>
<tr>
<td>28. Anthr SS 150</td>
<td>Peoples and Cultures of the World (5)</td>
<td></td>
</tr>
<tr>
<td>29. SW SS 105</td>
<td>Introduction to Social Welfare (3)</td>
<td>(or Soc SS 140)</td>
</tr>
<tr>
<td>30. GeoG SS 101</td>
<td>Human Geography (5)</td>
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</tr>
<tr>
<td>31. GeoG SS 103</td>
<td>World Regional Geography (5)</td>
<td></td>
</tr>
<tr>
<td>32. Honor SS (326H)</td>
<td>Utopia: The Ideal and Its History (2)</td>
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</tr>
</tbody>
</table>

#### Life Sciences Courses (LS) Approved List

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>1. ADVS LS 120</td>
<td>Anatomy and Physiology of Animals (5)</td>
<td></td>
</tr>
<tr>
<td>2. NPS LS 122 (122H)</td>
<td>Nutrition for People (3)</td>
<td></td>
</tr>
<tr>
<td>3. PSLK LS 100</td>
<td>Introduction to Agricultural Plant Science (4)</td>
<td></td>
</tr>
<tr>
<td>4. FW LS 280</td>
<td>Conservation Biology (3)</td>
<td></td>
</tr>
<tr>
<td>5. FW (B) LS 284 (284H)</td>
<td>General Ecology (5)</td>
<td></td>
</tr>
<tr>
<td>6. Biol LS 101</td>
<td>Biology and the Citizen (5)</td>
<td></td>
</tr>
<tr>
<td>7. Biol LS 102</td>
<td>Biology and the Citizen Laboratory (1)</td>
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</tr>
<tr>
<td>8. Biol LS 105</td>
<td>Discovering Nature (2)</td>
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</tr>
<tr>
<td>10. Biol LS 125</td>
<td>General Biology I (5)</td>
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</tr>
<tr>
<td>11. Biol LS 257</td>
<td>Evolution (3)</td>
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<tr>
<td>12. Micr LS 111</td>
<td>Elemental Microbiology Laboratory (1)</td>
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<tr>
<td>13. Micr LS 112</td>
<td>Insect Biology (3)</td>
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<tr>
<td>14. Ent LS 229</td>
<td>Human Anatomy (5)</td>
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<tr>
<td>15. PhyL LS 103</td>
<td>Human Physiology (5)</td>
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#### Physical Sciences Courses (PS) Approved List

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>1. Chem PS 200</td>
<td>Introduction to Weather (3)</td>
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</tr>
<tr>
<td>2. Chem (Geog) PS 382</td>
<td>Regional Climatology (3)</td>
<td></td>
</tr>
<tr>
<td>4. Engr PS 101 (101H)</td>
<td>Introduction to Engineering (2)</td>
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<tr>
<td>5. Geog PS 113</td>
<td>Physical Geography (5)</td>
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<tr>
<td>6. CS PS 101</td>
<td>Computers and Their Uses (4)</td>
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<tr>
<td>7. Chemistry—one of:</td>
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<td></td>
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<tr>
<td>Chem PS 101</td>
<td>Introduction to Chemistry (5)</td>
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<tr>
<td>Chem PS 111</td>
<td>General Chemistry (5)</td>
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<tr>
<td>Chem PS 121</td>
<td>Principles of Chemistry (5)</td>
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<tr>
<td>8. Chem PS 122</td>
<td>Chemical Principles Laboratory (1)</td>
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<tr>
<td>9. Chem PS 124</td>
<td>Elementary Organic Chemistry (4)</td>
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<tr>
<td>10. Chem PS 141</td>
<td>Molecules and Life (4)</td>
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<td>11. Chem PS 142</td>
<td>General Chemistry Laboratory (2)</td>
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<tr>
<td>12. Chem PS 144</td>
<td>Chemical Principles-Honors (3)</td>
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<tr>
<td>13. Chem PS 221H</td>
<td>Chemical Principles—Honors (3)</td>
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<tr>
<td>14. Chem PS 222H</td>
<td>Earth History (4)</td>
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<tr>
<td>15. Geology—one of:</td>
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<tr>
<td>Geol PS 101 (101H)</td>
<td>Introductory Geology (5)</td>
<td></td>
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<tr>
<td>Geol PS 105</td>
<td>Environmental Geology (5)</td>
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<tr>
<td>Geol PS 111 (111H)</td>
<td>Physical Geography (5)</td>
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<tr>
<td>16. GeoL PS 200</td>
<td>Earth History (4)</td>
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<tr>
<td>17. Physics—one of:</td>
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<td></td>
</tr>
<tr>
<td>Phys PS 100</td>
<td>The Solar System (3)</td>
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<tr>
<td>Phys PS 108</td>
<td>Stars and Galaxies (3)</td>
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<tr>
<td>Phys PS 200</td>
<td>Astronomy (3)</td>
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<tr>
<td>18. Physics—one of:</td>
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<tr>
<td>Phys PS 101</td>
<td>Introductory Physics (5)</td>
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</tr>
<tr>
<td>Phys PS 111</td>
<td>General Physics (5)</td>
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<tr>
<td>Phys PS 112</td>
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<td>Phys PS 113</td>
<td>General Physics (5)</td>
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<tr>
<td>Phys PS 120</td>
<td>General Physics—Science (5)</td>
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<tr>
<td>Phys PS 221</td>
<td>General Physics—Science (5)</td>
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<tr>
<td>Phys PS 222</td>
<td>General Physics—Science (5)</td>
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<tr>
<td>Phys PS 223</td>
<td>Planet Earth and the New Geoscience (3)</td>
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<tr>
<td>19. Honor PS (2250H)</td>
<td>From Newton to Einstein (2)</td>
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<tr>
<td>20. Honor PS (333H)</td>
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#### Integrative Option Courses (IO) Approved List

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>1. ADVS IO 130</td>
<td>Domestic Animals and Mankind (5)</td>
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<tr>
<td>2. ADVS IO 330</td>
<td>Animal Production and Public Policy (3)</td>
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</tr>
<tr>
<td>3. NPS IO 101</td>
<td>Food Fascinations and Fallacy (3)</td>
<td></td>
</tr>
<tr>
<td>4. Soils IO 400</td>
<td>Soil and Water Conservation (5)</td>
<td></td>
</tr>
<tr>
<td>5. BIO (305H)</td>
<td>The World of Systems (3)</td>
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<tr>
<td>6. BIO (306H)</td>
<td>Health and Wellness (2)</td>
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</tr>
<tr>
<td>7. HE P IO 250</td>
<td>Technology and Human Values (3)</td>
<td></td>
</tr>
<tr>
<td>8. Engr IO 320</td>
<td>Gender Roles in American Society (3)</td>
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<tr>
<td>9. H Env (Soc) IO 238 (238H)</td>
<td>Information Technology and the Future (3)</td>
<td></td>
</tr>
<tr>
<td>10. Engl (Hist) (Anthr) IO 326</td>
<td>Legacies, Myths, and Folktales (3)</td>
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</tr>
<tr>
<td>11. Hist (FW) IO 395 (395H)</td>
<td>Environmental History (3)</td>
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<tr>
<td>12. Hist IO 401</td>
<td>The Civilization of Human Societies (5)</td>
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<tr>
<td>13. L Lin (Anthr) IO 340</td>
<td>An Introduction to Linguistics (5)</td>
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<tr>
<td>14. Anthr IO 210</td>
<td>Perspectives on Race (3)</td>
<td></td>
</tr>
<tr>
<td>15. Anthr IO 231</td>
<td>Introduction to Archaeology (5)</td>
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</tr>
</tbody>
</table>
Pathways to Knowledge (3)
Wilderness in America (3)
Natural Resources and the Future (3)
Environmental Education (4)
World Wildlife (3)
Oceanography (4)
Human Impact on Environment (5)
Plants and Civilization (3)
Evolution and Environmental Issues (4)

**Broadening Knowledge Requirement (Option II)**

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. Students completing the Liberal Arts and Sciences certificate will receive notation of its completion on their transcripts. Students must apply for the Liberal Arts and Sciences Certificate in the Science/HASS Advising Center in Student Center 304.

**Approved Courses for LAS Certificate**

**LAS 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.

**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 Literatures: American Nature Writers (3)
ThArt HU 201 Understanding Movies (3)
Music 430 Proseminar in Music History (3)
Art HU 101 Exploring Art (3)
LAEP HU 103 Introduction to Landscape Architecture (3)
LAEP 412 Emerging Areas in Landscape Architecture (5)
**C. Beauty in Science**
Select at least two courses and a minimum of five credits:
Biol LS 105 Discovering Nature (2)
Biol LS 106 Discovering Nature (2)
Geol PS 101 Introductory Geology (5)
Phys PS 100 The Solar System (3)
Phys PS 108 Stars and Galaxies (3)
Phys PS 200 Astronomy (3)
Phys 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)
**ThArt HU 140** Exploring Performance through Literature (5)
**Music 518** Composition and Analysis (3)
**LAEP 135** Theory of Design (4)

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

**A. Select at least two courses:**
Hist SS 104 Western Civilizations: Ancient and Medieval (5)
Hist SS 105 Western Civilizations: 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)
ThArt 205 Introduction to Theatre Studies II (3)

**C. Select at least one course:**
Biol IO 205 Plants and Civilization (3)
**Anthr 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 (I)
Chem PS 101 Introduction to Chemistry (5)
Phys PS 120 General Physics Survey (3)

**E. Select at least one course:**
Phil 310 History of Ancient Philosophy (4)
Phil 311 History of Medieval Philosophy (4)
Phil 312 History of Early Modern Philosophy (4)
Phil 313 History of 19th Century Philosophy (3)
Phil 315 20th 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 (3)
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)
Honor HU 311 Classical Mythology in Western Art (3)
ThArt 430 History of the Theatre I (3)
ThArt 432 History of the Theatre II (3)
Music 450 Proseminar in Music History (3)

**F. Capstone Course**
Select at least one course upon completion of sections A, B, C, D, and E above:
Music 450 Proseminar in Music History (Beethoven and Age of Revolution) (3)
Hist 309 History of Christianity (3)
PolSc 433 History of Political Thought II (4)

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

Science and Society Cluster. A minimum of 20 credit hours must be completed. Students must complete classes from all five areas as indicated, with at least three credits in each section.

**Required Course:**
Sel 150 Science Orientation (1)

**A. Physical Sciences. Select at least one course:**
- Chem PS 101 Introduction to Chemistry (5)  
- Phys PS 120 General Physics Survey (lab) (5)  
(May substitute the series Phys 221-223 or Phys 111-113)

**B. Life Sciences. Students must complete:**
- Biol LS 101 Biology and the Citizen (5)  
(May substitute the series Biol 125-127)

**C. Social Sciences. Select at least one course:**
- Econ SS 200 Economics I (5)
- PolSc SS 101 Government and the Individual (4)
- Soc SS 101 Introduction to Sociology (5)
- Anthr SS 101 Introduction to Anthropology (5)
- Anthr SS 110 Human Origins (5)

**D. Integration of Knowledge. On completion of sections A, B, and C, select at least one course:**
- Phys 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)
- Honor IO 309H Science Perspective (2)
- Econ 255 Economics and Man's Environment (4)
- PolSc 418 Natural Resources and Environmental Policy (4)

**E. Capstone Course. After finishing sections A-D, students must complete:**
- Sel 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 111 Physical Geology (5)
- Soils PS 200 Soils, Waters, and the Environment (3)
- FW IO 250 World Wildlife (3)
- Biol LS 101 Biology and the Citizen (5)  
(May substitute the series Biol 125-127)

3. **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)
- Anthr 305 Anthropology and Religion (3)
- L Lin 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)
- PolSc 310 Global Interdependence (3)
- Econ 255 Economics and Man's Environment (4)
- Engl 356 Topics in American Literature: American Nature Writers (3)

**D. Future Environments. Must take one of the following courses:**
- PolSc 418 Natural Resources and Environmental Policy (4)
- PolSc 410 Politics and Public 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.** This new LAS cluster, which will be available beginning fall quarter 1994, was under development when this catalog was published. For information on course requirements, contact the Science/HASS Advisement Center in Student Center 304.

**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 SS 200 Economics I (5)
- Hist SS 170 American Civilization (5)
- PolSc SS 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; however, students may elect to take General Education courses for personal and professional enrichment.

**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 9 for Credit Transfer Policy of Utah System of Higher Education.
General Education Requirements

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 Science Area of Broadening Knowledge Requirement Credit Distribution Table 1, on page 23 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 class schedule.

Broadening Knowledge Requirement (30 credits)

Credit Distribution

<table>
<thead>
<tr>
<th>Humanities and Arts (HU)</th>
<th>Social Sciences (SS)</th>
<th>Life Sciences (LS)</th>
<th>Physical Sciences (PS)</th>
<th>Integrative Option (IO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-16</td>
<td>5-16</td>
<td>6-6</td>
<td>0-5*</td>
<td>0-9**</td>
</tr>
</tbody>
</table>

*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)

Select five courses, one from each of the two breadth areas and one from each of the three depth areas. Econ 200 is required.

Breadth Areas

1. Fine and Performing Arts

<table>
<thead>
<tr>
<th>Art HU 101 (3)</th>
<th>Music HU 102 (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art HU 279 (3)</td>
<td>Music HU 201 (3)</td>
</tr>
<tr>
<td>Art HU 276 (3)</td>
<td>Music HU 300 (3)</td>
</tr>
<tr>
<td>Art HU 277 (3)</td>
<td>ThArt HU 101 (5)</td>
</tr>
<tr>
<td>LAEP HU 103 (3)</td>
<td>ThArt HU 140 (5)</td>
</tr>
<tr>
<td>Music HU 101 (3)</td>
<td>ThArt HU 201 (3)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Anthr SS 101 (5)</th>
<th>Hist SS 105 (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthr SS 102 (3)</td>
<td>Hist SS 170 (5)</td>
</tr>
<tr>
<td>Engl HU 121 (5)</td>
<td>PolSci SS 101 (4)</td>
</tr>
<tr>
<td>Geog SS 101 (5)</td>
<td>PolSci SS 110 (5)</td>
</tr>
<tr>
<td>Hist SS 104 (5)</td>
<td>Soc SS 101 (5)</td>
</tr>
<tr>
<td>SS/History CLEP (if 3 or more credits earned) (3, 6, 10)</td>
<td>AP History (score of 3, 4, or 5) (12)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Econ SS 200 (req.) (5)</th>
<th>Econ 501 (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ SS 301 (5)</td>
<td>Geog IO 171 (5)</td>
</tr>
<tr>
<td>Econ 401 (3)</td>
<td>Geog 351 (3)</td>
</tr>
<tr>
<td>Econ 500 (4)</td>
<td>NRE 101 (3)</td>
</tr>
<tr>
<td>PolSci 418 (4)</td>
<td></td>
</tr>
</tbody>
</table>
4. International Perspectives

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthr SS 150 (5)</td>
<td></td>
</tr>
<tr>
<td>Anthr IO 210 (3)</td>
<td></td>
</tr>
<tr>
<td>Econ 515 (5)</td>
<td></td>
</tr>
<tr>
<td>Econ 580 (3)</td>
<td></td>
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<tr>
<td>PolSci SS 220 (5)</td>
<td></td>
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</tbody>
</table>

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

5. Human Behavior and Value Systems

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthr 401 (3)</td>
<td></td>
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<tr>
<td>Engl HU 120 (3)</td>
<td></td>
</tr>
<tr>
<td>FHD SS 304 (3)</td>
<td></td>
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<tr>
<td>LAS IO 125* (3)</td>
<td></td>
</tr>
<tr>
<td>MHR SS 311 (4)</td>
<td></td>
</tr>
<tr>
<td>Phil HU 101 (5)</td>
<td></td>
</tr>
<tr>
<td>Phil HU 111 (4)</td>
<td></td>
</tr>
<tr>
<td>Phil HU 215 (5)</td>
<td></td>
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<tr>
<td>Phil 326 (3)</td>
<td></td>
</tr>
<tr>
<td>Phil 327 (3)</td>
<td></td>
</tr>
</tbody>
</table>

*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, 797-1128

College Academic Service Offices

College of Agriculture, AG S 223, 797-2267
College of Business, B 306, 797-2275
College of Education, EDUC 101, 797-1437
College of Engineering, EC 110, 797-2705
College of Family Life, FL 205A, 797-1530
College of Humanities, Arts and Social Sciences, SC 304, 797-1198
College of Natural Resources, NR 112, 797-2448
College of Science, SER 101, 797-2478
Undeclared Program, 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

The University Honors Program offers a variety of opportunities for academically motivated students in all majors. These include courses; independent study; research; and extracurricular academic, cultural, and social programs. Students are invited to join the program upon demonstration of a reasonable prospect of maintaining a 3.3 GPA at the University. In general, students completing high school with a 3.75 GPA or an ACT composite score of 27 may expect admittance, as may University and transfer students with a 3.3 GPA. Others may apply in writing to the director.

The aim of the program is to give its students an enriched experience through the challenge of intense interaction with faculty and peer students in small-group or one-on-one settings.

Students may apply specified Honors coursework to the University's general education requirement, either through broadening knowledge quadrants, the Engineering General Education Program, or through the Liberal Arts and Sciences certificate.

They may earn their bachelor's degrees with University Honors and/or with Departmental Honors in an academic major upon meeting defined criteria. For University Honors, these include selected general education Honors work, upper division Honors work, and a senior thesis and seminar to equal 40 Honors credits. For graduation with Honors in an academic major, criteria include upper division Honors coursework and the senior thesis and seminar for a total of 20 credits work under an approved plan. Departmental plans have been approved in 34 academic majors to date (winter 1994). A cumulative GPA of 3.50 is required by most departments. Details of specific options may be obtained from the Honors Program office and from department Honors advisers.

The Honors Program is administered by its director, a University faculty Honors Advisory Board, and by an Honors Student Council. The Honors Council plans and administers many of the activities of the program and has substantial input into academic policies.

The Honors Program is housed in the Honors Center, Merrill Library 372-377. The program assistant and secretary, the director, a computer room, study rooms, and an Honors lounge are Library 372-377. The program assistant and secretary, the director, a computer room, study rooms, and an Honors lounge are available for student assistance and for relaxation and informal interaction.

In addition to Honors sections of departmental courses, the following Honors courses are offered through the program. The nature of the program dictates frequent changes in offerings. Check with the Honors Program office for current listings. Registration for these courses requires Honors status or permission of the instructor.

Honors Courses

SK 100H. Library Literacy. Information retrieval skills for research libraries. (2F, W)

IO 104H. Ideals of a University. 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, S, Sp) ®

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

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)

PS 250H. Planet Earth and the New Geoscience. An interdisciplinary examination of Earth incorporating the physics, chemistry, and geology of its formation, its present characteristics, and its future. Text, video, and expert guests are utilized. (3W)

SB 303H. Utopia: The Ideal and Its History. History of the utopian ideal from Plato to contemporary socialism. (2)

IO 309H. Science Perspective. A critical examination of the scientific method. (2)

HU 311H. Classical Mythology In Western Art. An examination of certain myths of the Greeks and Romans as artistically employed or recreated in selected paintings, sculpture, music, and literary works produced in western civilization. (3)

330H. Godel, Escher, Bach: An Eternal Golden Braid. An examination of the relationship of art, music, and mathematics from the significant book by Hofstadter. (1W)

332H. Seminar for Law Students. Ethical and social issues of law practice, for students who have been admitted to law school. Taught by practicing attorneys and University faculty. (2)

HU 326H. Women: Perspectives. This class examines significant literature by and about women to perceive images and roles, feminine uniqueness, perception differences, and values relevant to the struggle of women. (2)

PS 333H. From Newton to Einstein. A science seminar considering great modern scientific minds for both science and nonscience majors. (2)

380H. Philosophy in Science Fiction. Considers major philosophical issues as addressed in science fiction books and films. (2Sp)

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. (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. Course may be proposed by students, faculty, or the Honors director. (1-5F, W, S, Sp) ®

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, S, Sp) ®

480H. Honors Senior 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. Senior 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. (1-9) ®

® 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, Joan R. McFadden, 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
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 17 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, 797-1198

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 opportunity 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
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 areas are: Asian Studies, Black Studies, Environmental 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 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.

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 Latin America, 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 100 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 countries such as Austria, France, Belgium, Germany, and Hungary. Exciting new opportunities for study in such countries as the Ivory Coast, Fiji, Bangladesh, 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 Rosalie Muegglerr, 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; Pusan National University, Pusan, Korea; and Nan Kai University, Tianjin, China. The Department of Languages and Philosophy offers a winter quarter in Mexico (Mexico City or Merida) and a summer quarter in Germany (Freiburg, Bavaria). 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 Rosalie Muegglerr, Study Abroad Coordinator, 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 available in the Assistive Technology Laboratory.
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: LaVell E. Saunders
Office in Student Center 302, 797-1128

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 a college of their choice. To accomplish this purpose, participants are urged to limit their course loads each quarter, satisfy remedial course 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 professional 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, remedial, preventive, and development 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/Fact Sheets.** Free handouts dealing with learning and life skills topics.

**Tutoring.** Free drop-in tutoring in Math, Chemistry, Physics, and Computer Science.

**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 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.

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. 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.

Women's Studies

Program Coordination: College of Humanities, Arts and Social Sciences
Office in Student Center 310, 797-1728

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 office of the College of Humanities, Arts and Social Sciences.
Liberal Arts and Sciences Program

Director: Ann Leffler
Office in Main 131, 797-2039

Associate Director: Norman L. Jones
Office in Main 321G, 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) was recently 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. With college and departmental consent, its Area Studies Certificate may be used in place of the General Education broadening knowledge requirements described in the General Education section of this catalog.

LASP is an exciting combination of courses combining "back to basics" rigor with an interdisciplinary emphasis on themes for the twenty-first century. While LASP offers a major and a minor, its emphasis and pride is the Area Studies Certificate. The LASP Area Studies Certificate 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 awareness 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 a 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 1994, five clusters will be 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.

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 63 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 Emphases (30 credits of social sciences and 30 credits of humanities and arts)
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

10 125. 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)

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. (1-3F,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 Resident Instruction: Weldon S. Sleight
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
- Nutrition and Food Sciences
- 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 85 million people employed in the United States, about 21 million (24 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.

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...
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, 9 credits; PISci 100, 4 credits; Soils 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, 36 credits; ADVS1: 508, 509, 512, 513, 519, 3-16 credits.

Plant or Soil Science. Bimet 200, 3 credits; Soils 470, 555, and 556, 9 credits; Soils 513, or 565 and 566, 5 credits; PISci 360, 432, 440, 450, 555, 565, 23 credits.

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

Agricultural Systems Technology. PISci 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, 26 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 corridors, 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. (SW)

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. (SW)

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. (SW)

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. (SW)

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

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 Science (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 1-59 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 administers the prespecialization program for the college and provides initial counseling and guidance until such time as a student declares a major. 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 Core Courses.

Admission to the college does not insure access to the core courses required for graduation. Only those students who have completed a minimum of thirty (30) quarter credits of accepted college-level coursework with a total cumulative grade point average of 2.00 or better will be admitted into 200- and 300-level core courses in 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. (See departmental write-ups for core course listings.)

Scholarship Requirements for Admission to 300-level Courses.

Access to 300-level College of Business courses in Accounting, Business Administration, Business Information Systems and Education, and Management and Human Resources is restricted to students who have completed a minimum of sixty (60) quarter credits with a minimum overall GPA of 2.50. The exceptions to this restriction are Acctg 311; BIS 300, 303, and 340; and BA 346. Students who were enrolled at USU prior to fall quarter 1988 and who have not had a break in enrollment in excess of one year may be admitted to 300-level Business Administration, Business Information Systems and Education, and Management and Human Resources courses with a 2.20 minimum overall GPA.

General Education and Communication Skills Requirements.

Students who entered USU prior to fall quarter 1983 may satisfy general education requirements in two ways. They may satisfy general education requirements in effect for the College of Business when they entered the college or they may satisfy the current general education requirements. Students who entered USU beginning fall quarter 1983 must satisfy the new (current) general education requirements for the College of Business with the following exception. Students who entered the School of Accountancy beginning summer quarter 1991 must satisfy separate general education requirements (see departmental write-up).

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.

Prespecialization Program. All degree-seeking students in the college are required to take the following core program prior to admission to "advanced standing" within the chosen departmental major field: Acctg 201, 203 (8 credits), BIS 255 (3 credits), Econ 200, 201 (10 credits), Math 105 (5 credits), MHR 299 (4 credits), Stat 250 (5 credits), CS 150 or 170 (4 credits), BIS 140 (3 credits), and either Acctg, 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 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 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, B 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. 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 are restricted to the following categories of students:

2Operational 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.
1. Those having been admitted into advanced standing.
2. Graduate students.
3. Those requiring the course for a minor, or to meet requirements of other majors. All course prerequisites must be satisfied.
4. Those having an overall GPA of 2.50 or above.

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 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 designed to develop a general business background and perspective. Completion of this minor will acquaint students with each business discipline. 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.

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, B 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.
- Data Processing Management Association (DPMA): Organization for students planning careers in information processing and information systems management.
- Delta Pi Epsilon (DPE): National graduate honorary fraternity in business education.
- 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.

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.

3Exceptions 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 Teacher Education and Certification:  
To be appointed  
Associate Dean for Continuing Education and Field Services:  
Varnell A. Bench  
Associate Dean for Research: Ron J. Thorkildsen  
Assistant to the Dean for Technology: J. Steven Soulier  
Teacher Dean for Research: Ron J. Thorkildsen  
Associate Dean for Teacher Education and Certification:  
To be appointed  
Associate Dean for Continuing Education and Field Services:  
Varnell A. Bench  
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  
- Elementary Education  
- Health, Physical Education and Recreation  
- Instructional Technology  
- Psychology  
- Secondary Education  
- Special Education  

The College of Education provides preparation programs for prospective teachers, for counselors and other professional personnel in education, for professionals in the human services area, and for educators placed 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 Teacher Education and Certification 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 Ed Ed 100, SecEd 201, and Sp Ed 301, students are not permitted to enroll in any professional education courses in Elementary and Secondary Education, nor in PE P 460, Psy 366, and Com D 365 prior to being admitted into the Teacher Education Program. All applicants must take the writing diagnostic 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 Teacher Education and Certification.

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, instructional technology 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 or secondary education is designed for a student preparing to teach in either 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. Both a Doctorate of Education (EdD) and a Doctorate of Philosophy (PhD) degree are available with emphasis in the areas of Business Information Systems and Education, Curriculum and Instruction, Instructional Technology, and Research and Evaluation. A PhD degree in Psychology and Special Education is 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. (35p)

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:


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

618. Theories of Supervision. (3 Alt Su)

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

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

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

660. Correlation and Regression in Psychology and Education. Prerequisite: Psy 380. (3)

661. Inferential Statistics in Psychology and Education. Prerequisite: Psy 380. (3)

666. Research for Classroom Teachers. (3W, Su)

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

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

674. School Law. (3Su)

677. Qualitative Methods I. (3 Alt W)

678. Qualitative Methods II. (3 Alt W)

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

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

710. Practices of Supervision. Prerequisite: Educ 610. (3W)

730. Philosophical, Historical, and Social Foundations of Education. Prerequisite: Educ 641. (6)

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

732. Supervision of Instruction. Prerequisite: Educ 710. (6)

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

750. School Finance. (3Su)

767. Designing Educational and Psychological Research. Prerequisites: Psy 660, 661, and 667. (3Sp, Su)

1Descriptions for courses in the 600 and 700 series can be found in the graduate catalog.

College of Engineering

Acting Dean: Alma P. Moser
Office in Engineering Class 110, 797-2775

Associate Dean: Ronald L. Thurgood
Academic Adviser: Kathleen E. Bayn
Academic Adviser: Janet Hanson
Industry and Professional Relations Director: Robert L. Davis

The College of Engineering includes the following research units:

Space Dynamics Laboratory: Allan J. Steed, Director
Center for Space Engineering: Frank J. Redd, Director
International Irrigation Center: R. Kern Stutler, Director
Utah Water Research Laboratory: David S. Bowles, Director
Engineering Experiment Station: Alma P. Moser, Acting Director

Interdepartmental research programs under the Engineering Experiment Station are:

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

The College of Engineering includes the following academic departments:

Biological and Irrigation Engineering
Civil and Environmental Engineering
Electrical 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 appreciation of the professional responsibility and ethics; (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 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.

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 advisor 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; Engr 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. (2F,W,Sp)

**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)


**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)

**203. Special Problems.** Independent or group student study of engineering problems not covered in regular course offerings. (1-15F,W,Sp,Su)

**10 320. 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)

**320. Thermodynamics.** First and second laws of thermodynamics. Prerequisite: Math 322. (3F,Sp)

© This course is also offered by correspondence through the Life Span Learning Independent Study Division.

**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 Financial Aid Office of the University before February 28 of the year they wish to receive assistance. 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.

**Space Dynamics Laboratory.** The research laboratories which comprise the Space Dynamics Laboratory (SDL) are located on the USU campus at Logan and at Bedford, Massachusetts. The faculty members of these laboratories hold academic appointments as appropriate in the Electrical
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, IE, 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

Associate Dean for Extension: Joan R. McFadden

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

General Family Life

Human Environments: Apparel Merchandising,
- Interior Design, Consumer Sciences, and

Home Economics Education
- Home Economics Education
- Apparel Merchandising
- Interior Design

Nutrition and Food Sciences
- Nutrition and Food Sciences, with emphases in Food Science,
  Dietetics, and Nutrition Science

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 was established in the fall of 1985 and can be earned with an emphasis in Family and Human Development at the present time.

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.
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, Apparel 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

118. 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 Main 131, 797-1200
Associate Dean—Academies: Joyce A. Kinkead, 797-1706
Associate Dean—Administrative Affairs: R. Edward Glattfelder
Associate Dean—Extension: David L. Rogers, 797-1255
Director, Center for International Studies: Yun Kim, 797-1231
Director, Liberal Arts and Science Program:
   Ann Leffler, Office in Main 131, 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
Coordinator, Study Abroad Program: Rosalie R. Muergler,
   Office in Student Center 304, 797-0601

The College of Humanities, Arts and Social Sciences has the following departments and programs:

Aerospace Studies
Art
Communication
English
History
Intensive English Language Institute
Landscape Architecture and Environmental Planning
Languages and Philosophy
Liberal Arts and Sciences Program¹
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 fulfilled.

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.

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: Kate M. Begnal, R WEST 304D, 797-3654

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. For further information see the program brochure or contact the office of the College of Humanities, Arts and Social Sciences.

Minor in Women’s Studies. Students may obtain a minor in Women’s Studies by completing a total of 18 credits in the field. H Env/Soc 238 is the only required course. The remaining credits should be selected from the following courses: Anthr 407 or 607, PE P 407, PolSci 319, H Env 355, Soc 473 or 673, Soc 680, Engl 330, Engl 533, El Ed 620, Honor HU 326, NFS 323, and Hist 460.

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. McNeary
Adviser: Horace N. Stogner, Jr.
Staff Assistant: Lynne M. Slade
Office in Student Center 304, 797-2048

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 34). 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 LASP 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 323, 797-1290

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

Coordinator: Rosalie R. Muiggler
Office in Student Center 304C, 797-0601

USU offers many exciting and rewarding opportunities for students to study abroad.

The Languages and Philosophy Department offers a Winter Quarter in Mexico experience, with locations alternating between Mexico City and Merida, Yucatan. Each summer, groups travel for language studies to 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.

Minor in Classics

Coordination: Mark L. Damen and Francis 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 departments of Economics, Political Science, and Sociology. 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, (3-6)
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, (3-6)
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

Assistant Dean: Frederic H. Wagner
Assistant Dean: James J. Kennedy
Assistant to the Dean: Charles W. Gay
Assistant to the Dean: Mary Lu Roskelley
Coordinator of Outreach Education: Sharon L. Ohlhorst
Academic Services Adviser: Maureen A. Wagner

The College of Natural Resources has the following departments and unit:
- Fisheries and Wildlife Department
- Forest Resources Department
- Geography and Earth Resources Department
- Range Science Department
- Watershed Science Unit

A list of degrees and areas of emphasis can be found in the section for each department or unit. The college also has an interdisciplinary program in environmental studies leading to the BS degree.

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 used for food, fiber, water, or recreation, and the management of these resources and their ecosystems. The 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 favorable geographic location of the college provides exceptional facilities for field experience. Forest and rangelands in Utah comprise more than 90 percent of the total state area. The Wasatch-Cache National Forest, within two miles of the school, the Bear River Migratory Bird Refuge and Bear Lake, within 40 miles, and vast areas of natural lands provide forest, range, soil conservation, and fisheries and wildlife problems, and offer unlimited study projects and opportunities for demonstration. Herds of elk and deer can be studied close to the campus during the winter. Primitive areas, Yellowstone Park, 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.

Students in the Department of Forest Resources may choose from three majors. The general forestry curriculum has programs of emphasis in forest biology, forest management, forest recreation, forest watershed management, urban forestry, natural resources policy, and computer forestry. The recreation resource curriculum has programs of emphasis in tourism and management. Environmental Studies is a broad, science-based curriculum that allows students to choose from many areas of specialization in their junior and senior years (e.g., an ecological, economic, or self-designed option).

Students in the Department of Range Science choose either the management or science option, both of which qualify graduates for a professional career in natural resources management. Students may also elect to pursue special interests in forest-range management, range-watershed management, range economics, international range management, range-wildlife relations, range economics, international range management, or rangeland rehabilitation.

The Department of Fisheries and Wildlife offers comprehensive educational opportunities for students interested in the analysis and management of fish and wildlife populations, their habitats, and the related ecosystems. The traditional focus on management for a harvestable surplus of animals has expanded over the past 30 years to include management for nongame and endangered species, management for the protection of biodiversity, and the management of wildlife interactions with humans. The Fisheries and Wildlife major offers specialization in the areas of terrestrial wildlife and fisheries management, with emphases in wildlife management, fisheries management, wildlife damage management, conservation biology, law enforcement, and graduate school preparation.

The Geography and Earth Resources Department offers students the opportunity to specialize in remote sensing, geographic information systems (GIS), cartography, environmental modeling, international development, community and rural planning, or geographic education.

The Watershed Science Unit offers an interdisciplinary program that trains students for professional and research careers in watershed management, hydrology, and watershed ecology.

Students will make more satisfactory progress 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. They require high aptitude for scholarship and technical development. Mere field ability is not sufficient. Success is correlated also with an ability to deal well with people.

Admission. Application forms may be obtained from the Admissions Office. Transfer students should send their college transcripts, with their application for admission, to the Office of Admissions and Records.

Freshmen accepted in good standing by the University are eligible for admission to the College of Natural Resources. Transfer students need a cumulative 2.2 GPA for admission to College of Natural Resources majors. Departments may impose additional requirements; refer to departmental sections for information.

Summer Camp. Successful completion of field instruction at the college-operated summer camp is required of students who plan to major in watershed science, the range management option in the Range Science Department, or the forestry and recreation resource management curricula in the Forest Resources
Department. In order to be admitted into summer camp, which is normally attended at the end of the sophomore year, a student must have achieved a 2.5 grade point average in College of Natural Resources courses and must have completed most of the coursework required in the first two years of the program.

The camp begins the first Monday after commencement and continues for seven weeks. Thirteen credits are allowed for the complete program. In addition to the regular summer quarter fees, several classes require lab fees. Board is provided on a cost basis; lodging is without cost.

Forestry majors must complete summer camp prior to taking FR 324 and 330. Range Science majors in the management option must complete the camp before taking RS 561, 563, and 570.

Field Trips. Several are planned each year as part of regular class instruction. Besides short trips scheduled for individual courses, some departments conduct extensive field-problems trips. Fees are usually charged each student to defray expenses of the trips.

Loan Funds. Several sources of funds are available on a loan basis to worthy, deserving upper division students in the College of Natural Resources. Loans are made for short periods. Application should be made through the dean's office.

Scholarships and Assistantships. A number of scholarships and assistantships are available to students in the college. The largest is the S. J. and Jessie E. Quinney Scholars Program, which offers 15 four-year scholarships to entering and transfer undergraduate students in the College of Natural Resources. There are also many $300-$1,000/year scholarships for continuing students.

Interested high school seniors and transfer students are encouraged to write to the dean's office regarding these scholarships. See also Awards, Honors, Scholarships, and Grants-in-aid in this catalog.

Graduation Requirements. The following general requirements must be met for graduation from the College of Natural Resources: (1) 199 credits in the Department of Forest Resources, depending on major; (2) 186 credits in the Department of Fisheries and Wildlife, the Department of Range Science, and the Department of Geography and Earth Resources; (3) 203 credits in the Watershed Science Unit; (4) all courses prescribed under the study program of one's chosen field; (5) fulfillment of the General Education requirements of the University; (6) proficiency in written and spoken English (if deficient in English, a student is required to pass certain supplementary or corrective courses in addition to regular requirements); (7) a grade point average of 2.5 in professional courses and 2.0 in all University courses, except that geography majors and teaching minors are required to maintain a 2.5 grade point average in all geography courses. A deficiency in grade point may be remedied by taking additional professional courses or by repeating professional courses for which a low grade was received.

**Natural Resources Courses**

The College offers the following interdepartmental courses tying together basic concepts, problems, and purposes in the various natural resources fields:

- **NR 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)
- **NR 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)
- **NR 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. (4F,Sp)
- **NR 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)
- **NR 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)
- **NR 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. Prerequisite: NR 360 or permission of instructor. (4W)
- **NR 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. (4Sp)
- **NR 491. Natural Resources Study Abroad Internship.** For students participating in the College of Natural Resources undergraduate study abroad program. (1-15F,W,Sp,Su)
- **NR 501. Natural Resources for Teachers.** Field course designed to acquaint teachers with natural resource issues, teaching methods, and materials. (2-4Su) 0
- **NR 511 (d611). Environmental Education.** Acquaints students with the nature of our environment and the management concepts that can help solve environmental problems. Prerequisite: Math 105, Stat 201, or equivalent. (4F,W)
- **NR 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)
- **NR 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: general ecology, Math 215, Stat 301 or equivalent, CS 241, or consent of instructor. (3Sp)

**Graduate**

- **NR 601. Directed Teaching in Natural Resources.** (1-5F,W,Sp,Su)
- **NR 611 (d611). Environmental Education.** (4Sp)
- **NR 644. Natural Resource and Environmental Policy Seminar Series.** (1Sp)
- **NR 645. Natural Resource and Environmental Policy Presentation.** (1Sp)

1Descriptions 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

The College of Science has the following departments and programs:

- Biology
- Chemistry and Biochemistry
- Computer Science
- Geology
- Liberal Arts and Sciences Program
- 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 249. 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.

Advanced Placement Credit

Students who have taken advanced placement courses in science, computer science, or mathematics and who have scored sufficiently high on the AP exams are given credit toward graduation. These students should check with the individual departments to determine where they should be placed in their courses.

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) Phys 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.

1Jointly administered with the College of Humanities, Arts and Social Sciences.
Note: The above Bachelor of Science requirements are not in effect for the Bachelor of Arts degree.

Science Majors

A lower division student who wishes to major in science, but who has not selected a specific major, may register in the college as a science major. During the freshman year, a course of study will be taken which will prepare the student for further study in any of the departments within the college. At the end of one year of study, the student should transfer to a specific department.

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 MMMath (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 34-35.

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 general education requirements and in the Area Studies Certificate in the Liberal Arts and Sciences Program (LASP). The Area Studies Certificate may be substituted for the Broadening Knowledge portion of general education (see page 34). The center also advises all other students interested in the LASP option.

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. (IF,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 Professor James W. Brackner

Director of Research: 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 Professor E. Vance Grange; Adjunct Assistant Professors M. Kay Jeppesen, Dale G. Siler; Instructors Ralph L. Peck, Jack W. Peterson, Franklin D. Shuman; Adjunct Lecturer Ray J. Larsen

Degrees offered: Bachelor of Science (BS), and Bachelor of Arts (BA) in Accounting; Master of Accounting (MAcc)

Objectives

The objectives of the accounting program emphasize preparation for professional careers in accounting. Two programs are offered which prepare students for professional accounting careers in business, government, and public accounting. Students may complete a baccalaureate program or continue for an additional year of study to complete the requirements for a Master of Accounting degree. The Master of Accounting program provides students with greater breadth and depth of accounting and/or taxation knowledge and qualifies them to take the Certified Public Accountant’s examination in the state of Utah.

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 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 21-28, 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 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 25-26 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 the Department of Economics 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 Acctg 201, 203, and 311; MHR 299; and BIS 255.

2. A 2.20 overall GPA and completion of 60 credits are required for admission into BIS 310, 314, 330, 350, and 370.

3. An overall GPA of 2.50 and completion of 60 credits are required for admission into Acctg 312, 313, 331, and 341; BA 308, 321, 340, 350, and 370; and MHR 311, 360, and 364.

4. All 400- and 500-level courses in the College of Business, with the exception of Economics courses, are restricted to students with Advanced Standing. A 2.50 overall GPA is required for admission into these courses.

**Advanced Standing Requirements**

Students are required to achieve Advanced Standing to be admitted to the School of Accountancy. Until 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 Advanced Standing in the School of Accountancy are as follows:

1. Students must have completed or must be currently registered for 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 or must be currently registered for 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: Acctg 100, 201, 203 (Acctg 100 is not required if a College of Business major is declared after 100 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: Acctg 311, Math 215; Spsc 105, 260, or 305; Psy 101 or Soc 101; BIS 340; 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 must be filed with the School of Accountancy two quarters before anticipated graduation.

**Business Core Requirements (33-34 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 400, 401, 500, or 501; BIS 440; 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 one year ahead. Following is a list of required courses: Acctg 201, 203, 311, 312, 313, 331, 341, 450, and 451. Students must also select two of the following courses: Acctg 410, 505, 521, 531, or 541. Acctg 521 and 541 are required for the Master of Accounting Program and suggested for CPA exam candidates, along with MHR 501, Advanced Business Law. Acctg 505 and 531 are suggested for careers in industry, along with MAE 211, Manufacturing Operations—Fundamentals, and MAE 310, Manufacturing Processes. 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: Acctg 201, 203, 311, 312, and 331. One additional 300-, 400-, or 500-level accounting course is also required.
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. Students with an undergraduate degree in accounting who meet 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. (1)

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: Acctg 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. Prerequisite: Acctg 203. (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: Acctg 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: Acctg 312. (4F, W, Sp)


341. Income Taxation I. Emphasis on Federal income taxation of individuals. Introduction to taxation of corporations and tax research methods. Prerequisites: Acctg 311 or permission of instructor. (4F, Sp, Su)

410 (6610). 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: Acctg 311, CS 150 or 170, BIS 440 or proficiency in database applications. (4F, W, Sp)

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: Acctg 450. (4F, W, Sp)

479. Internship in Accounting. Accounting work experience with public accounting firms and approved business concerns. Prerequisite: Acctg 451 or 541. (1-4F, W, Sp, Su)

485H. Senior Honors Seminar. Presentation of senior thesis project created in the 493H 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: Acctg 312. (4F, W, Sp)

531. Cost Accounting II. Cost accounting cases, problems, and theory. Selected topics include systems design, cost allocations, decision models, cost behavior, and variances. Prerequisite: Acctg 331. (4Sp)

541. Income Taxation II. Federal income taxation of partnerships, corporations, S-corporations, estates and trusts, and gifts. Prerequisite: Acctg 341. (4F, W, Su)

565 (6665). Accounting Topics and Issues. Selected contemporary accounting topics and issues, including the study of accounting for specialized industries. (1-4)
Department of Aerospace Studies

College of Humanities, Arts and Social Sciences

Head: Professor and Lt. Colonel Ken Peterson
Office in Military Science Building, 797-8723

Assistant Professors Captain Douglas J. Bristow, Captain Donna M. Howell, Captain Robert F. Rocco

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 cadets must meet the physical fitness and medical standards for general military service.

Age Limitations. To qualify as a pilot or navigator, cadets must be able to finish the aerospace studies program and graduate from the University before age 26 1/2 years. Other cadets must complete the military program and graduate from the University prior to reaching the age of 30.

Academic Requirements. Once a student enters the last two years of AFROTC, successful completion of the course becomes a requirement for commissioning. In addition, when entering the final two years, a student must agree to accept an Air Force commission 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 degree.

Although the AFROTC program is designed primarily for the student to complete in four years, all requirements for commissioning may be completed in 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 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. Parts of the general military course may be waived for prior military service. Veterans normally will be entered in the two-year program.

Scholarships and Financial Aid

Financial Aid. AFROTC cadets will normally receive a $100 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 all tuition and fees, provide textbook allowances, and $100 per month nontaxable. (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, mathematical reasoning, and foreign language course requirements as established by AFROTC.

Uniforms and Texts. All Air Force texts and uniforms are furnished at no expense to the student.
Aerospace Studies 59

Miscellaneous Information
All Cadets. To meet the challenge of the aerospace age, its technological advances, and its ever-broadening horizons, 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. Attention 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 Class Schedule for the Leadership Laboratory schedule.

Aerospace Studies Courses


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—1. 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—2. 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)

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)

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)

311, 312, 313. Leadership Laboratory—3. 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)


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)

411, 412, 413. Leadership Laboratory—4. 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)

1This 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: Professor V. Philip Rasmussen
Office in Agricultural Systems Technology and Education 101C, 797-2230

Professors Robert L. Gilliland, Gilbert A. Long, Weldon S. Sleight; Associate Professor Gary S. Straquadine; Associate Professor Emeritus Keith W. Hatch; Assistant Professors Richard M. Joeger, Kathryn L. “Kitt” Farrell-Poe, Bruce E. Miller, Stephen E. Poo; Lecturers Darwin S. Jolley, Evan P. Parker

Degrees offered: Bachelor of Science (BS) in Agricultural Education; BS and Master of Science (MS) 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.

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; BIS 140; Chem 111; Ins T 445, 447; Math 101; PISci 310, 430, 555; Psych 101, 366; SecEd 301, 302, 404, 510; and Soils 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: BA 340 or 346, 350; MHR 299, 311, 364; Acctg 201, 203; BIS 310; Econ 400 or 401; ASTE 300, 309, 360; ADVS 245; BIE 310; Soils 358, 359; and one additional Soils course. Additional requirements in Animal Science, Plant Science, and Range Science must also be met. In addition, students must complete designated electives and the University General Education requirements.

The Bachelor of Science in Agricultural Systems Technology, Mechanization Option, includes the following courses: ASTE 101, 201, 283, 360, 301, 309, 375, 400, 432, 520; Chem 111, 141, 144 or Chem 121, 122; Econ 200, 201; Math 105; Stat 201 or 230 or 501 and Soils 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
Agricultural Systems Technology and Education Courses

Agricultural Systems Technology and Education Courses

1.01. 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)

1.12. Forage and Harvesting Equipment. Theoretical principles and applied technology of forage and harvesting equipment. (3F)

1.13. Agricultural Plasting and Tillage Equipment. The fundamentals and principles in the operation, maintenance, and repair of agricultural, planting, and tillage equipment. (3Sp)

1.14. Agricultural Power Units. Principles involved in overhauling and reconditioning agricultural power units including engines and subassemblies. Prerequisite: ASTE 101. (6F)

1.16. Agricultural Electrical Components. The various types of electrical components are studied as they are applied on agricultural equipment and power units. (3F)

1.16. Agricultural Machinery Hydraulics. Principles and components utilized in agricultural machinery hydraulic technology as related to the hydraulic system. (3W)

1.16. Agricultural Machinery Power Trans. The fundamental principles in the transmission of power from the tractor power unit to the implement. (6W)

1.16. 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)

1.20. Maintenance of Dairy Equipment. Principles involved in maintenance of dairy equipment and facilities including electricity, plumbing, refrigeration, air and vacuum, and feeding equipment. (3W)

1.20. 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)

1.225. Occupational Experience in Agriculture. Supervised occupational experiences for technical vocational preparation. (1-5F, W, Sp, Su) @


2.71. 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)

2.83. Agricultural Marketing and Sales. A beginning study of agriculture, business, and marketing, distribution, marketing, and sales. (3F)

2.93. Individualized Projects in Agricultural Mechanics. Basic skill preparation for employment in agricultural industry. (1-5F, W, Sp, Su) @

3.00. 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)


3.03. 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. (3F)


3.05. 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. Prerequisite: upper division standing and completion of Engli 200, 201, or equivalent. (3F, W, Sp)

3.09. Computer Systems and Their Application in Agriculture. Use of programmable calculators, microcomputers, and other computer systems in solving problems common to agriculture. Prerequisite: BUS 140. (3F, Sp)

3.10. 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)

3.324. 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)

3.35. 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. (3F)


3.345. 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)

3.360. Agricultural Machinery Management. Principles of agricultural machinery management consisting of factors in lengthening agricultural equipment life and/or purchasing used and new equipment. (3Sp)


3.372. Agricultural Equipment Testing and Diagnosis. Electrical. Techniques in diagnosing malfunctions and related failures will be explored. A system diagnostic method will be developed. (3F)

3.373. Agricultural Equipment Testing and Diagnosis. Hydraulic. Techniques in diagnosing hydraulic malfunctions and related failures will be explored. A system diagnostic method will be developed. (3W)

3.374. 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. (3Sp)

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)


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 (6611) ™. 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 (6616). 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 (6620). A Systems Approach for Analyzing Agricultural Issues. Case studies of current controversial agricultural systems. National and global ramifications are explored. (3Sp)

526 (6626). 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 (6651). 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 (6655). 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)

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)

618. Supervision in Extension. (3W)

611 (6511). 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 (6516). Applications of Agricultural Controls. (4F)

620 (6520). 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 (6526). Impacts of Agricultural Practices on Water Quality. (3F)

630 (6330). Foundations of Adult Education Programs. (3F)

651 (6551). Principles and Practices of Extension Education. (3F)

655 (6555). 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)


699. Continuing Graduate Advice. (1-3F,W,Sp,Su) ®

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1Parenthetical numbers preceded by d indicate a dual listing; parenthetical numbers preceded by an f are the former course numbers.

2Descriptions 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

Professors Stanley D. Allen, Clive W. Arave, Clell V. Bagley, Thomas D. Bunch, Roger A. Coulombe, Jr., Mark C. Healey, Lyle G. McNeal, R. Dean Plowman, Raghurip P. Sharma, 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, Don W. Thomas; Adjunct Professors E. Marlowe Goble, Lynn F. James, Nicholas C. Leone; Adjunct Research Professors Royal A. Bagley, Michael R. Marshall, Rex S. Spendlove, Glenn N. Taylor; Associate Professors Michael J. Arambel, W. Craig Burrell, Noelle E. Cockett, Howard M. Deer, Haven B. Hendricks, Nyle J. Matthews, Kenneth C. Olson, Larry M. Slade, Wallace R. Taylor, Kenneth L. White, Randall D. Wiedmeier; Associate Professors Emeritus Donald C. Dobson, Darrell H. Matthews, Charles H. Mickelson; Adjunct Associate Professor Calvin C. Willhite; Research Associate Professors Ronald L. Boman, John D. Morrey, Donald F. Smees; Research Associate Professor Emeritus Melvin J. Anderson; Adjunct Research Associate Professors Bronwyn G. Hughes, John D. Olsen; Assistant Professor G. Reed Holyoak; Adjunct Assistant Professors David H. Clark, David D. Frame, John T. Lohr, Scott R. Woodward; Research Assistant Professors Dale L. Barnard, F. Dustan Clark, John H. Huffman, M. Keven Jackson, Luz S. Teicher, Jeffrey L. Walters, Robert E. Warnick, Shiguang Yang; Research Assistant Professors Emeritus Paul V. Fonnesbeck, Leonard C. Karel; Adjunct Research Assistant Professors Frank L. Barnes, Philippe Collas, Kip E. Panter, Kathleen R. Rasmussen, Gary D. Snowden, Bryan L. Stegelmeier; Instructors R. Cole Evans, Shiquan Wang, Lee G. Wood

Degrees offered: Bachelor of Science (BS) in Animal Science, Dairy Science, Bioveterinary Science; Master of Science (MS) 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 Program: Dairy Herdsman

Objectives
BS degree students majoring in animal or dairy sciences may choose a program from seven career emphasis areas: (1) production/management, (2) business, (3) research, (4) extension, (5) molecular biology, (6) communications, and (7) international work. Prevetinary students may earn a BS degree in bioveterinary science, animal science, dairy science, or other related degree programs.

Animal and Dairy Sciences

Production/Management Emphasis. In addition to the required core courses, this emphasis area provides some freedom for students to take coursework in subjects of special interest. In consultation with their advisers, students may schedule directed elective courses to help them prepare for professional careers. Additional courses in animal, dairy, or veterinary sciences, as well as classes in crop production, range science, accounting, business, agricultural engineering, and machinery, may be useful for those planning to operate or manage farms or ranches.

Business Emphasis. Students may select the business emphasis area to prepare for professional herd management, consulting, corporate animal agriculture, sales and service businesses, commercial banking and credit, and other businesses related to livestock production, processing, and marketing. Students must complete the basic core curriculum and other courses in the department, as well as those in economics, agricultural economics, business, computer science, and accounting.

Research and/or Extension Emphasis. For students desiring education beyond the BS degree, these emphasis areas prepare for graduate studies in specialized areas such as breeding, nutrition, physiology of reproduction, behavior, or prevetinary science. On completing their graduate studies, students will be prepared for employment in research, teaching, extension service, government agencies, or private corporate business.

Molecular Biology Emphasis. This emphasis area prepares students for courses required in a graduate program that combines animal science and molecular biology. After completing a BS degree, the student would begin a research program that utilizes molecular biology techniques in studying some of today's major agricultural problems. Students completing graduate studies would be prepared for professional employment in research, teaching, or private corporate business.

Communications Emphasis. Students interested in preparing for a career in animal agriculture communications can receive basic training in the areas of public relations, journalism, broadcast agricultural news with TV or radio, or news editorial work. This emphasis can lead to positions with livestock breed associations, livestock publications, and any of the multitude of media forms utilized to inform the masses about animal agriculture. The basic core curriculum is also required for this emphasis area.

International Emphasis. Today many opportunities exist for animal agriculturists in international work with foreign countries. In addition to completing the basic required core curriculum, students in this area interface closely with the USU College of Agriculture requirements for an international agriculture degree. Students concentrating in either the Animal or Dairy Sciences discipline will have sufficient background training to be prepared for professional employment in international corporate work, such as animal feeds/nutrition, animal health, livestock exporting, technical assistance to developing countries, United Nations FAO programs, and the Peace Corps.
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 will 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.

Preveterinary students who want to obtain a BS degree within the ADVS department may elect a major in bioveterinary science. They may also obtain a BS degree in animal science or dairy science with a preveterinary option.

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 Program

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.

Requirements

Departmental Admission Requirements. Undergraduate admission requirements for the Department of Animal, Dairy, and Veterinary Sciences are the same as those described for the University. Students in good standing may apply for admission to the department.

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) A grade point average of 2.25 must be attained in all ADVS courses specified as core requirements in the Animal Science or Dairy Science curriculum or as requirements in the Bioveterinary Science curriculum. (2) Courses required for the major may be repeated only once to improve a grade. (3) Courses required for the major may not be taken for pass/fail credit.

Academic Advising. The format of the animal and dairy science core curriculum with emphasis areas has reduced the required course/credit load, opening up new areas to provide greater opportunities and flexibility in the majors. However, the “core concept” with “emphasis areas” requires that a very close student-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 Core Requirements

Freshman year: ADVS 108, 111, 120, 125, 213 (D), 251; minimum of two ADVS production practices courses chosen from ADVS 208, 209, 212, 213, or 219 (A); Biol 125; Chem 111, 141, 144; Math 101; Engl 101 or 111; 0-6 credits of General Education, ADVS directed electives, and emphasis area electives*.

Sophomore year: ADVS 202, 300, 350, 351, 365 (A); NFS 340 (D); Stat 201, 230, or 301; Engl 200 or 201; 18-22 credits of General Education, ADVS directed electives, and emphasis area electives*.

Junior year: ADVS 420, 421; minimum of 3 credits from ADVS 425 or 480, 455 (D), 456, 457, 491; Engl 301 or 305 or ASTE 305; 31-34 credits of General Education, ADVS directed electives, and emphasis area electives*.

Senior year: ADVS 492; any two ADVS upper division animal species management courses (A); ADVS 513 (D); NFS 345 (A); 26-39 credits of General Education, ADVS directed electives, and emphasis area electives*.

Suggested Support Courses for Animal/Dairy Science Emphasis Areas

Courses selected from the following are in addition to the Animal or Dairy Science core curriculum.

Production Management Emphasis. ADVS 101 (D), 129 (A), 166 or 271 (A), 225, 272 (D), 309 (A), 330, 366 (D), 375, 553 (D), 559 (A), 586 (A), 1 additional 200-level ADVS production practices course (A), 1 additional 500-level ADVS management course (A); ASTE 200 (D), 303, 360; MHR 235 (D), 311; Econ 331 (D), 402, 403; Agctg 201; NFS 303 (D); PlSci 430, 432; RS 300 (A); Soils 358.

Business Emphasis. Acctg 201; ADVS 330, 375, 391 (A); BA 340, 350; BIS 140, 255; MHR 299, 311; Econ 200, 402.

Research Emphasis. ADVS 549, 553, 554, 582; Biol 319; Physl 504; Chem 331, 332, 334, 335, 370, 371; Microb 301; Stat 301; Phys 111, 112, 113.

Molecular Biology Emphasis. Biol 319; Chem 331, 332, 333, 334, 335, 370; Microb 301; Stat 301.

Extension Emphasis. ADVS 271 (A), 272 (D), 330 (D), 425; ASTE 310, 551; Comm 130, 206, 384; MHR 299. Additional credits in computer technology, ADVS Production and Management courses, BA and Econ courses.


International Work Emphasis. ADVS 130 (D), 375 (D); ASTE 101, 200 (D), 300, 301, 345, 360 (A); Econ 303, 304; PlSci 100; Soils 358.

(A) Required of Animal Science majors.
(D) Required of Dairy Science majors.
*Students must see academic advisers for approved courses.
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 majors also apply to minors (see page 64).

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; 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; 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, and 271 for a total of at least 18 credits.

**Beef Production**: ADVS 111, 208, 225 (coop experience with beef), 245, and 271 for a total of at least 18 credits.

**Horse Production**: ADVS 111, 165, 219, 225 (coop experience with horses), and 245 for a total of at least 18 credits.

**Horse Training**: ADVS 111, 165, 219, 265; 5-credit elective 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, 225, 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, 271, 309 for a total of at least 18 credits.

**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.

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; 3 credits of Humanities electives.

**Sophomore year**: Chem 331, 332 and 334, 370 and 371; Biol 125, 126, 127; ADVS 392; Stat 201; 3 credits of Humanities electives; Econ 200 or Hist 170 or PolSe 110; 5 credits of Social Science electives.

**Junior year**: Phys 111; Biol 319; Engl 200 or 201; Micro 301; ADVS 202, 251, 300, 392, 420, 421, 549; 6 credits of Humanities electives; 9 credits of other electives.

**Senior year**: ADVS 350, 351, 569, 570, 571; Engl 301 or 305 or ASTE 305; Zool 555; 18 credits other electives.

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. 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


104. Dairy Herd Records. Record keeping systems, tax records, estate planning, DHI records. Principles of credit and finance, and loan sources. (3Sp)

105. Dairy Cattle Genetics and Breeding. Principles of dairy genetics, mating, pedigrees, and breeding. Purebred cattle, type traits, and classification. (4W)

106. 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)

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. (3F,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)

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. (5W)

121. Companion Animals. The science of companion animals (horses, dogs, cats, etc.), including bonding, behavior, nutrition, environment, health, reproduction, and breeding. (3F)

125. Applied Agricultural Computations. Intended to develop understanding and proficiency in the application of mathematical skills to practical computations required in agricultural science. (3Sp)

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)

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, aesthetic, and ethical significance. (5F,Sp)

165. Western Horsemanship I. Grooming, saddling, bridling, mounting, seats and hands, horsetracking 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)

201. Biotechnology in Agriculture. Classroom instruction will be used to introduce the student to the basic principles and concepts of biotechnology in agriculture. Topics will include: plant, food and nutrition, animal, and medical aspects of agricultural biotechnology. Three lectures. Prerequisite: Biol 125. (3W)

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. (3W,Sp)

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)


251. Animal Foods. Physical and chemical characteristics of animal foods 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, rein 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)

272. Dairy Cattle Evaluation and Judging. Evaluation of type and breed characteristics of dairy cattle utilized for milk production. Judging, grading, and oral reasons will be emphasized. One lecture, two labs. (3Sp)

292. Orientation to Veterinary Medicine. Preparation of pre-veterinary 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 preventative 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)

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. (1F)

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. (SF)

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 species (beef and dairy cattle, sheep, swine, and horses). One lecture, one lab. Prerequisites: ADVS 251, 350. (2W)

365. Live Animal and Carcass Evaluations. 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)


375. Computer Application In Animal Agriculture. Provides basic computer knowledge to utilize computers for data analysis in animal management decisions, business, record systems, and communication. Two lectures and one lab. Prerequisites: CS 150 or equivalent and a knowledge of statistics or permission of instructor. (3F)

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. (1-3F,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. (1-5F,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 Phys 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) ®


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. Prerequisites: Biol 152, 319, 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)

508 (6008). 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 (6009). 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. (3Sp)

512 (6012). 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 (6613). Dairy Cattle Management. Evaluating dairy herd’s 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)

519 (6619). 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)

540 (6640). 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 (6649). Laboratory Animal Management. Principles of management of laboratory research animals: mouse, rat, guinea pig, rabbit, hamster, dog, cat, monkey, and birds. Covers breeding, feeding, handling, identification, and sanitation. (3Sp)

**553 (6653). 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 (6654). 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 (6659). Wool Science. Biology of fiber growth: Histology, fiber arrangement, morphology, and fleece genetics. Environmental and physiological factors affecting wool growth. Prerequisite: Biol 125. (3Sp)

569 (6669). 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 (6670). General Pathobiology. Principles of structural and functional mechanism of abnormal reactive processes in animals. Three lectures, two labs. Prerequisite: ADVS 569. (5W)

571 (6671). Special Pathobiology. Correlates abnormality with causes; disease processes studied by systems, organs, and cells. Three lectures, two labs. Prerequisite: ADVS 570. (5Sp)

**582 (6682). 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 (6685). 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. For nonmajors. Prerequisites: RS 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)
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 L. Anderson, Glen L. Edwards, Ray W. Hellberg, Adrian Van Suchteilen; Professors Emeritus R. T. Clark, Harrison T. Groutage, Jessie Larson, Gaell Lindstrom, Twain C. Tippett; Associate Professors Craig Law, John Neely, Christopher T. Terry; Assistant Professors Sara J. Northerner, Gregory Schulte, Janet Shapero, Thomas E. Toone, Susanne J. Warma; Temporary Assistant Professor 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


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 101, 102, 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 may 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, plus three credits from the art history group (Art 101, 275, 276, and 277), and 15-18 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, 478, 481, 482, 483, 484, and 589).

Emphasis Areas

Art History. The requirements for a BA in Art History are separate from those of other degrees offered by the Art Department. They are as follows: 52 credits of coursework in the major with a 2.5 grade point average required for graduation. Basic coursework (21 credits) is to be completed within the first eight quarters and includes Art 101, 102, 120, 160, 275, 276, 277, plus Phil 215. 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.

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 craftsmen 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.

**Graphie 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 6 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)

**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,5u)

**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)

**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,Sp)

**240.** Basic Typography Design. Problems in typography, layout, and design for advertising and graphic design layouts. Learning type faces, printing methods, and ordering type. (3F,W)

**255.** Basic Printmaking. An introduction to the theoretical and visual approach of printmaking. Studio work in the media of relief and intaglio. Prerequisites: Art 160, 175, 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. (3F,W,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)


**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 on multiple production. Prerequisites: Art 217 and 218. (3W,Sp) ©

**322.** Intermediate Drawing. A continuation of basic drawing emphasizing more complex drawing problems, techniques, and approaches. Prerequisite: Art 120. (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 120, 122, and 226. (3W)

**327.** Watercolor and Related Media. Exploration of formal, technical, and conceptual problems in water media. Prerequisites: Art 120, 226. (3F,Sp)

**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—Techniques. Experience working with a variety of media on a variety of surfaces. Painting from the model and homework. (3W)  
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)  
341. 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 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)  
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)  
422. Drawing and Composition. Advanced drawing problems emphasizing various approaches to composition. Prerequisites: Art 120, 322. (3Sp)  
427. Painting: Composition and Color. Study of color with an emphasis on applied color interaction. Prerequisites: Art 102, 120, and 226. (3W)  
428. Drawing and Composition. Advanced drawing problems emphasizing various approaches to composition. Prerequisites: Art 120, 322. (3Sp)  
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)  
436. Fashion Illustration. Creation of art appropriate for reproduction as fashion illustrations in newspapers, magazines, etc. Drawing from the model and homework. (3Sp)  
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)  
*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, Mycenes, Greece, and the Roman world. (3W)  
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 Neo-classicism to Symbolism. Prerequisite: Art 277 or consent of instructor. (3)  
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. (3F)  
514. Student Teaching at University Level. Teaching techniques and procedures for university level. Prerequisite: approval of major professor. (1-9F,W,Sp)
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 225, 326, 427. (3Sp)

529. Figure Painting. Painting from the live model with emphasis on solving problems of the human form. Prerequisites: Art 326 and 421. (3FSp)


531. Graphic Design Studio. Individual production of prints using all printing media and techniques. Emphasis on woodcuts in fall; lithography in winter; etching in spring. Prerequisite: Art 255. (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

615. Graduate Ceramics 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) 


645. Graduate Graphic Design Studio. (1-9F,W,Sp) 


674 (d474). Greek and Roman Art. (3W)

675 (d475). Medieval Art. (3) 

678 (d478). Renaissance Art. (3) 


681 (d481). Baroque and Rococo Art. (3) 

682 (d482). Nineteenth Century Art. (3) 

683 (d483). Twentieth Century Art. (3W) 

684 (d484). American Art. (3F) 


699. Continuing Graduate Advisement. (1-3F,W,Sp) 

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1Parenthetical numbers preceded by * indicate a dual listing.

2Descriptions 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 Life Span Learning Independent Study Division.

*Taught 1994-95.

**Taught 1995-96.
Department of

Biological and Irrigation Engineering

College of Engineering

Head: Professor Wynn R. Walker
Office in Engineering Class 216, 797-2785


Degrees offered: Bachelor of Science (BS), Master of Science (MS), and Doctor of Philosophy (PhD) in Biological and Agricultural Engineering; MS in Irrigation Science; 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, crop water requirements and yield response, and the specific challenges in designing and managing these systems. Food and Bioprocess Systems Engineering deals with machines, devices, and processes in food preparation, handling, and transport, as well as the treatment, disposal, and biodegradation of biowastes and the engineering inputs to biotechnology.

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 42-46. 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; Engr 200; 3 credits of HU/SS.

Sophomore Year: BIE 233; Econ 200; EE 270; Engl 201; Engr 103, 202, 204; ITE 227; Math 320, 321, 322; Micr 111, 112; Phys 221.

Junior Year: BIE 367, 470, 487; CEE 350, 351; Chem 331, 334; Engl 305; Engr 330; 3 credits of HU/SS; 18 credits of technical electives.

Senior Year: BIE 488, 489; Biol 576; CEE 420, 425; 17 credits of HU/SS; 15 credits of technical electives.
Acceptable Technical Electives in three specializations (33 credit hours total):

**Soil and Water Resource Systems Engineering, BIE 518, 525, 543, 545, 546, 547, 548, 550, 556, 560, 580; CEE 224, 343, 543, 585; MAE 334; Math 461; Soils 358, 359, 565, 566; WS 545, 549.**

Food and Bioprocess Systems Engineering, BIE 580, 581, 582, 583, 584; CEE 365, 565, 568, 585; Chem 332, 333, 335, 370, 371; ITE 352; MAE 334; Math 461; NFS 511, 544, 550, 556, 557; WS 545. 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 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)

**233. Engineering Properties of Biological Materials.** Relationships between composition, structure, and properties of biological materials. Definitions, measurement, and use of mechanical, thermal, electromagnetic chemical, and biological properties in computation and design. (4W)

**310. Irrigation Principles.** For students in colleges other than engineering: surveying, water measurement, conveyance, application, consumptive use, requirements, pumping, drainage, and soil-water relationships. Prerequisite: Math 101. Two lectures, one lab. (3F)

**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. Prerequisite: Engr 330; CEE 350, 351. (3Sp)

**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. (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 agricultural and irrigation engineering subjects not covered in regular course offerings. (1-6F, W, Sp, Su)

**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. (4Sp)

**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. (4Sp)

**543 (d663). Principles of Irrigation Engineering.** For engineering students. Soil-water-plant relationships; water requirements; efficiency of water use; flow of water in soils; effects of irrigation on water quality. Prerequisites: Engr 103 or CS 241; CEE 350 concurrent. (4W)

**545 (d665). Drainage Engineering.** Introduction to principles and practices of drainage. Engineering investigation and design of open drains and wells. Prerequisite: CIE 350. Three lectures, one lab. (4Sp)

**546 (d666). 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, fluxes, 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. (3W)

**548 (d668). Surface Irrigation Design.** Design, evaluation, and management of basin, border, and furrow irrigation systems. Field measurements in evaluating system performance and design. Land leveling computation and equipment. Headland and tailwater facilities. Automation. Prerequisite: BIE 543. (3Sp)

**550 (d610). Irrigation System Analysis.** Field lab with formal reports covering water measurement; soil-water management, land leveling, and evaluation of border, furrow, sprinkles, and trickle systems. One recitation, one double lab. Prerequisite: BIE 543, 547, 548 or concurrent registration. (3Sp)

**556 (d616). Design of Water Control Structures.** Design of transitions, drop, chutes, spillways, checks, headgates, and other control structures for water conveyance systems. Prerequisite: CEE 350 or 351. (2Sp)

**560 (d620). Water Management.** Organization and administration of water distribution institutions. Financing for construction and operation, maintenance of canals, fluxes, pipelines, dams, regulating reservoirs, and other water facilities. Prerequisite: BIE 543. (3W)

**580. Bioprocesses in Engineered and Environmental Systems.** Applications of microbial metabolism, physiology, and ecology to degradation of waste materials in engineered systems and the environment. Prerequisites: MIE 311 and 112 or MIE 301. (4F)

**581. Biochemical Engineering.** Fundamentals of bioreactor design and biochemical engineering. Emphasis is placed on microbial systems for pollution control. Prerequisites: MIE 111 and 112, or 301, and HHS/CEE 367. (3W)

**582. Biomass Processing.** Introduction to the use of renewable resources for energy production and waste management. Prerequisites: MIE 111 or 112, 301; 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: Soils 200 or BIE 543; CEE 350 and 351. (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/CHEE 367. (3sp)

Graduate

603 (d543). Principles of Irrigation Engineering. (4W)
605 (d545). Drainage Engineering. (4Sp)
606 (d546). Water Supply Development and Conveyance Systems. (3W)
607 (d547). Sprinkle and Tricktr Irrigation. (5W)
608 (d548). Surface Irrigation Design. (3Sp)
610 (d550). Irrigation System Analysis. (3Sp)
616 (d556). Design of Water Control Structures. (2Sp)
618 (d518). Engineering Aspects of Soil and Water Conservation. (4Sp)
620 (d560). Water Management. (3W)
625 (d525). Principles of Remote Sensing and Applications in Agriculture and Hydrology. (4Sp)
631. Field Irrigation Management. (3F)
645. Drainage Principles. (3F)

693. Special Problems in Agricultural Engineering. (1-5F,W,Sp,Su) ®
696. Supervised Teaching in Irrigation. (2-3F,W,Sp)
699. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

**733. Surface Irrigation Engineering. (3Sp)
**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. (3Sp)
780. Seminar. (1-2F,W,Sp) ®
799. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ®

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.
*Taught 1994-95.
**Taught 1995-96.
Department of Biology
College of Science

Head: Professor Edmund D. Brodie, Jr.
Office in Biology-Natural Resources 117, 797-2483

Associate Head: Associate Professor David B. Brown
Office in Biology-Natural Resources 143, 797-2485

Professors Anne J. Anderson, William A. Brindley, LeGrande C. Ellis, James A. Gessaman, Mark C. Healey, Ting H. Hsiao, Joseph K.K. Li, James A. MacMahon, Ivan G. Palmblad, Jon Y. Takeuchi, Sherman V. Thomson, Reed P. Warren, Nabil N. Youssef; Adjunct Professor Rex S. Spendlove; Professors Emeritus William R. Bowman, Jr., W. S. Boyle, Donald W. Davis, Keith L. Dixon, Warren C. Foote, B. Austin Haws, Gene W. Miller, Frederick L. Reed, James T. Sorensen; Associate Professor John M. Simmons, John J. Skujins, Hugh P. Stanley; Associate Professors Mary E. Barkworth, James W. Haefner, Wilford J. Hanson, Michael J. Jenkins, Raymond J. Lynn, Frank J. Messina, Keith A. Mott, Richard J. Mueller, Kimberly A. Sullivan, Dennis L. Welker, George W. Welkie; Research Associate Professors Bill B. Barnett, Darwin L. Sorensen; Adjunct Associate Professors John C. Bailey, Jay B. Karren, Vincent J. Tepedino, Richard C. Wang; Assistant Professors Diane G. Alston, Edward W. Evans, Elizabeth E. Hood, Bradley R. Kropp, Gregory J. Podgorski, John M. Stark, Dana K. Vaughan, Paul G. Wolf; Research Assistant Professors Joanne E. Hughes, Martin G. Klots; Clinical Assistant Professor Daniel A. Boston; Adjunct Assistant Professors Leila M. Shultz, Philip F. Torchio; Principal Lecturer David M. “Andy” Anderson; Lecturer Alice M. Lindahl; Research Associate Catherine T. Hsiao; Collaborators Ray W. Brown, William P. Nye

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: George Stewart, 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 Brown, BNR 143.

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 205; (4) Phys 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.

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; Microb 301; and one upper division physiology course selected from Bot 440, Ent 332, or Microb 401; or Phys 305 and one of Phys 501, 502, or 504. No more than one elective course in biology numbered less than 300 can be counted toward the 60 credits. In addition, BS students must complete Math 220 and 221; Chem 121, 122-124, 123-160, 331, 332, 334, 335; one additional 3-5 credit upper division Chemistry course; and either Phys 111, 112, and 113 or Phys 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 17 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 Phys 120 or Phys 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 a Bachelor of Science degree 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. Required courses include Biol 125, 126, 127; Pub H 470, 499, 510, 512, 530; Microb 301; Chem 121, 122-124, 123-160 (Chem 111, 141-144, 142 for education option); Phys 111, 112, 113 (Phys 120 for education option).

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 courses: 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, BNR 101, or the Director of Undergraduate Studies, BNR 143, 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 Secondary Education or the Department of Biology. 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 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 101. 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 102. Biology and the Citizen**. Principles of biology as they impact the daily life and environment of the individual. Five lectures illustrated with visuals and demonstrations. (4F, W, Sp, Su)

**LS 103. 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. (1F, W, 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 (25Sp, 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. (3F, Su)

**LS 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 or permission of instructor. Four lectures, one lab. (5W)

**LS 127. General Biology III**. Diversity, structure, reproduction, development, and homoeostasis of animals. Prerequisites: Biol 125 and 126 or permission of instructor. Four lectures, one lab. (5Sp)

**IO 105. 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)

**IO 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). (3W)

**IO 319. Principles of Genetics**. An introduction to the classical and molecular aspects of modern genetics. Prerequisites: Biol 125 and College Algebra. (5F, W, Sp)

**IO 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. Prerequisites: Biol 125, 126, and 127; or permission of instructor. (4F, W)

**387. Field Ecology**. Sampling theory and methods in ecology; characteristics of aquatic, desert, and montane ecosystems. Prerequisites: Biol 125, 126, and 127 or equivalents, and Biol 386. Recommended: Stat 201 or 301. (2F, Sp)

**391. Independent Study**. Directed individual or group study in biology. Prerequisite: Biol 125, 126, 127, and faculty member's consent. 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. (1-6F, 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 125, 126, 127, and faculty member's consent. 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)
**621. Advanced Cell Biology. (4Sp)**


**629. Plant Molecular Biology. (4F)**

**Graduate 2**

**617. Introductory Population Genetics. (3W)**

**618. Molecular Population Genetics Laboratory. (5F)**

**619. Molecular Genetics.** Molecular aspects of genetics, including DNA replication, structure, rearrangement, transposition, recombination, repair, genetic engineering, and gene expression. Prerequisites: Biol 319 and consent of instructor. (3W)

**621. Advanced Cell Biology. (4Sp)**


**630. Evolutionary Ecology. (3F)**


**662. Scanning Electron Microscopy. (3Su)**

**674. Molecular Biology Laboratory. (3Sp)**

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. Recommended prerequisite: Biol 101 or equivalent. (3Sp)

*441. 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. (4P)

530. Insect Taxonomy. Classification of insects to family, including basic external morphology. Collection required. Three lectures, one lab. Prerequisite: Biol 127 or consent of instructor. (4P)

**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. Prerequisite: Insect Biology and Biol 386 or instructor’s permission. (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: basic entomology or permission of instructor. (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

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) (P)

691. Special Problems in Entomology. (1-6F,W,Sp,Su) (P)

Microbiology Courses

LS 111. Elementary Microbiology. Biology and role of microorganisms in natural processes. Not intended for biology majors, who should take Micrb 301. May be used as a prerequisite (together with Micrb 112) only for Micrb 330 and 560. (4F,W)

LS 112. Elementary Microbiology Laboratory. Nature of microorganisms, media preparation, and laboratory techniques. Accompanies Micrb 111 which must be taken as a prerequisite or concurrently. (1F,W)

301. Microbiology I. Microbes, their ecology, biology, and role in nature. Emphasis on the bacteria. Three lectures, two labs. Prerequisites: Biol 125, 126, 127, and organic chemistry (may be taken concurrently). (4P)

401. Microbiology II. Physiology, genetics, and structure of selected prokaryotic and eukaryotic microbes, and the viruses. Three lectures, two labs. Prerequisites: Micrb 301 and Biol 319; Chem 333 or 370 recommended. (5W)

502. Pathogenic Microbiology. Properties of pathogens and their relationships to infectious diseases. Four lectures, one lab. Prerequisite: Micrb 301 or permission of instructor. (5W)

503. Immunology. The immune response in the host animal and immunologic procedures. Prerequisites: organic chemistry, Biol 125, 126, 127, 319, or permission of instructor. (SSp)

*530 (d530). Soil Microbiology. Activities and ecology of microorganisms related to the soil environment, soil fertility, soil organic matter, rhizosphere, and soil amendments. Prerequisites: general biology, organic chemistry. (3W)

*531 (d631). Soil Microbiology Laboratory. Application of soil microbiological techniques. Two labs. Prerequisite: Micrb/Soils 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: Micrb 111 or 301. (3Sp)

561. Aquatic Microbiology Laboratory. Application of aquatic microbial techniques. Two 1.5-hour labs per week. Prerequisite: Micrb 112 or 301 and Micrb 560 concurrent or previously. (1Sp)

570. Virology. Structure, replication, genetics, and molecular biology of viruses; virus-host interactions; viral diseases and antiviral agents. Prerequisites: Micrb 301 and Biol 319; Micrb 401 recommended. (4Sp)

571. Virology Laboratory. Introduction to laboratory techniques using bacterial and animal viruses. Prerequisite: previous or concurrent enrollment in Micrb 570. (2Sp)

Graduate

**603. Advanced Immunology. (2F)

*630 (d630). Soil Microbiology. (3W)

*631 (d631). Soil Microbiology Laboratory. (2W)

**635. Soil and Environmental Biogeochemistry. (3Sp)

*670. Advanced Animal Virology. (3Sp)

691. Special Problems in Microbiology. (1-6) (P)

780. Seminar. (1) (P)

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)

LS 130. Human Physiology. Functioning of the human body, with emphasis upon major organ systems. Five lectures, one lab. (5F,W,Sp,So) (P)

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. (3Sp)

400. Human Dissection. Skeletal anatomy and prosection of the human body. One lecture, one lab. Prerequisite: Physl 103 or equivalent. (2W)
501. Mammalian Physiology I. An intensive, detailed study of membrane
physiology, muscle, neurophysiology, sensory physiology, excretion, and body fluids.
Prerequisites: Biol 125, 126, 127, Chem 123, 160, and a course in Physics. (4F)

502. Mammalian Physiology II. An intensive, detailed study of metabolism,
thermoregulation, digestion, respiration, circulation, and the cardiovascular system.
Prerequisite: Phys 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 125, 126, 127, Phys 130, and Chem 331, 332. (45p)

504. Comparative Animal Physiology. Survey of physiological adaptations of
vertebrates and invertebrates to environmental variables and strategies that underlie
the evolution of organ systems for excretion, respiration, circulation, digestion, and
integration. Prerequisites: cell biology or physiology, chemistry (preferably organic),
and introductory physics. (35p)

505. Animal Physiology Laboratory. Intensive, hands-on course using classical
preparations to train students in experimental design, data analysis, and writing
research reports. Prerequisites: Phys 501 (502 recommended) or 504 or instructor’s
consent. (25p)

Graduate

**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. (1-6F,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: one year each of
biology and chemistry, and Microb 111-112 or 301. (45p)

512. Communicable Disease Control. Mechanisms of transmission, control, and
prevention of communicable diseases. Prerequisites: Microb 111-112 or Microb 301.
(3F) ©

516. Food-borne Disease Control. Principles of food-borne disease transmission,
control, and enforcement. Prerequisites: Microb 111-112 or Microb 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 or equivalent, Microb 111-112
or 301, and Pub H 512 or permission of instructor. (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 125, 126, 127, and
Chem 123, 160, or permission of instructor. (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: Pub H 540. (3W)

542. Industrial Health Hazards. Specific health-related problems of various
industrial processes are addressed, including hazard recognition, exposure assessment,
and control approaches. Prerequisites: Pub H 540, 541. (3Sp)

580. Seminar in Health Problems. (1Sp) ©

Zoology Courses

350. Vertebrate Biology. Topics in evolutionary biology and adaptive physiology of
the vertebrates. Three lectures, two labs or field trips. Prerequisites: Biol 125, 126,
127, or equivalent. (5F)

361. Field Ornithology. Identification, adaptations, and habitat distribution of local
birds. Two lectures, one field trip. (3Sp)

551. Invertebrate Zoology. The more important phyla of invertebrates, with some
consideration of local fauna. Three lectures, two labs. Prerequisites: Biol 125, 126,
127. (3Sp)

585. 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. Prerequisites: Biol 125, 126, 127,
or permission of instructor. (3Sp)

586. Avian Biology. Structure, function, classification, physiology, behavior, and
ecology of birds. Two lectures, one lab. Prerequisites: Biol 125, 126, 127, or
permission of instructor. (3Sp)

lectures, two labs. Prerequisites: Biol 125, 126, and 127. (5F)

567. Elements of Histology. Study of tissues, including characteristics of different
kinds of tissues and the main organs. Five lectures, one lab. Prerequisites: Biol 125,
126, 127, or permission of instructor. (5W)

573. Herpetology. Classification, distribution, life habits, and identification of
amphibians and reptiles, with emphasis on local forms. Three lectures, one lab.
Prerequisites: Biol 125, 126, 127, or permission of instructor. (4Sp)

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


681. Seminar in Vertebrate Zoology. (1) ©

691. Special Problems in Zoology. (1-6) ©

1Parenthetical numbers preceded by d indicate a dual listing.
2Descriptions 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 Life Span Learning
Independent Study Division.
*Taught 1994-95.
**Taught 1995-96.
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, Eugene C. Kartchner, Calvin D. Lowe, J. Robert Malko, C.R. Michael Parent, Paul A. Randle; Associate Professor Alan A. Stephens; Assistant Professors Kenneth R. Bartkus, Drew Dahl, Cathy Hartman; Instructor Edwin R. Stafford

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: Acctg 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 340.

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; Acctg 201, 203, 311; 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 advanced standing in the Department of Business Administration are as follows:

1. Have completed or currently be registered for 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 or currently be registered for 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. Courses in the prespecialization requirement may be repeated only once to improve a grade.

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; Econ 400 or 500; Econ 401 or 501.

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*The MHR 489 Business Policy course is a capstone course and should not be taken until near the end of the senior year.*
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 321, 430, 443, and 448; Acctg 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; Acctg 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.
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 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.

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. Orient freshmen and transfer students to College of Business programs, academic and student services, professional organizations, and career possibilities. (1)

SS 135. Introduction to Business. An introduction to the role of business in contemporary society, including an introduction to the general problems of business operation. (3F,W,Sp) ©

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)


321. 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. (3P)

322. Real Estate. Introduction to real estate contracts, forms, principles, and recent federal housing legislation. (3F,W)


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. Prerequisites: Math 105 and Econ 201. (4F,W,Sp,Su) ©

379. Production Management, Managerial aspects of production planning, procurement, inventory,
control, production control, quality control, layout, methods improvement, performance,

410 (d462). 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. Management of International Operations. (3)

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. Prerequisites: Econ 200, 201, Accctg 203,
BA 340. (4F, W, Sp)

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, Sp)

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, Sp)

448. Securities Analysis and Portfolio Theory. Study of modern investment analysis
and portfolio theory, risk-return analysis, common stock, and bond valuation theories.
Prerequisites: Stat 230, BA 340, 466. (3W, Sp)

451. Consumer Behavior. Treats strategic applications of behavioral science
corcepts 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.
Prerequisites: Stat 230, BA 350. (4F, W, Sp)

454. Retailing Management. Investigations of retailing as one aspect of the channel
distribution. Emphasis on the areas of managerial responsibility including location,
layout, buying, control, financial management, and promotion. Prerequisite: BA 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. Prerequisites: BA 350, 451. (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 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. Prerequisites: BA 308, 370. (5F)

475. Production Simulation. Computer simulation of production environment
including scheduling, routing, labor, capacity, inventory, and delivery. Just-in-time
concepts are emphasized. (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.
(15p)

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. (3W)

Graduate²

607. Survey of Corporation Finance. Taught only in Ogden. (3)

608. Survey of Marketing. Taught only in Ogden. (3)

610 (d446). 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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1Parenthetical numbers preceded by © indicate a dual listing.
2Descriptions 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 Life Span Learning
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, 797-2347

Microcomputer Laboratory Supervisor: James N. Elwood
Office in Business 103, 797-2270

Professors James Calvert Scott, H. Robert Stocker, William A. Stull; Associate Professors Thomas Hilton, Charles M. Lutz; Associate Professor Emeritus Floris S. Henderson; Assistant Professors Jeffrey J. Johnson, Dennis LaBonty; Lecturers Marianna Larsen, Susan M. Richards

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 concentrations in Information Systems Management, Business Education/Marketing Education, Training and Development; Master of Education (MED) in Secondary Education with emphasis 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, Business Education, Information Systems Management, Marketing Education, Business Administration, or others as approved by adviser

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 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. 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. 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 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 including current quarter registration, (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. Access to 300-level courses in the BISE Department is restricted. Only those students who have completed a minimum of sixty (60) quarter credits with a minimum GPA of 2.5 will be allowed to enroll in 300-level BIS courses. The exceptions to this restriction are BIS 300, 303, and 340. Bachelor degree candidates must have an overall GPA of 2.50 to graduate. 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.

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 2.50 is required to student teach. 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 department 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, 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 103 for additional details.

General requirements for all Business Information Systems majors are: Acctg 201, 203; BIS 100, 140, 230, 255, 310, 330, 340, 410, 425, 440; BA 340, 350, 370; MHR 299, 311, 360, 489; Stat 230; Econ 200*, 201; and general education requirements required by the University.

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 taken outside the College of Business. At least fifty percent of the business credits required for this major 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.

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, information managers, and other business information systems positions.

Required classes for the information systems management emphasis are: CS 170*, 171, 251 or 252; BIS 515, 520, or CS 575; BIS 510, 570; Math 215; plus 9 credits related to the major. It is strongly recommended that students take BA 308 and CS 260. 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 process information.

Required classes for the office systems management emphasis are: BIS 112, 142, 240, 252, 260, 541; CS 150*; Math 105; MHR 364 or Soc 332; plus 12 credits of approved upper division classes related to the major. BIS 520 is 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, 255, 310, 340, 440, 520, 561, 572, 573; Stat 230 (or Psy 380); BA 340, 350; MHR 299, 311, 360, 489; Acctg 201, 203; Econ 200, 201; Math 105; CS 150 or 170; 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 emphases:


2. Business and Accounting Emphasis: BIS 112, 314; BA 346, 370; MHR 235 or 435 or BA 454; Econ 401 or 510.

Additional courses for meeting certification and graduation requirements include: SecEd 301, 302, 404, 510; Psy 101 and 366; BIS 300, 303, 450, 460; Sp Ed 301; Ins T 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.

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: Acctg 201 and 203; Stat 230 (or Psy 380); BA 340, 350, 370; BIS 100, 112, 140, 225 or 425, 240, 255, and 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 300, 303, 450, 460, 561, 572, 573; SecEd 301, 302, 404, 510; Psy 101, 366; Sp Ed 301; and Ins T 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.

*These courses are General Education requirements.
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.

**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 support personnel. Emphasis is placed on job skills. Requirements are: BIS 100, 112, 140, 142, 155, 225, 230, 240, 252, 260; Acctg 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, 300, 561, 572, 573; and Acctg 201, 203. 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, 310, 314, 330, 340; MHR 299; and Econ 200.

A minor in Marketing Education consists of the following courses: BA 350; Acctg 201, 203; BIS 112, 140, 300, 561, 572; MHR 311, 360.

Requirements for the Business Computers and Information Systems minor are: BIS 112, 140, 230, 240, 310, 340, 440, 573; and CS 150. Students must also select at least two courses from the following: BIS 330, 410, 510, 515; CS 170, 251, 260; and Ins T 516, 616. 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, 310, 330, 340, 440, and CS 251 or 252. In addition, they must choose one course from the following: BIS 240, 410, 510, 515, 520, 541, 570 and CS 170. The following courses are also required for nonbusiness majors: Acctg 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.

**Data Processing Management Association (DPMA).** DPMA, a professional society for the information systems industry, sponsors a student chapter at USU. The goals of DPMA 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 co-curricular student organization is Phi Beta Lambda (PBL). The organization’s goal is to provide opportunities to develop career competencies and to promote civic and personal responsibility. Membership is open to all students interested in business.

**American Marketing Association.** The AMA Chapter is designed for both marketing and marketing education majors.

**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 Doctor of Education degrees. Emphases are offered in business education, marketing education, business communications, information systems, and other areas as approved by adviser.

See the graduate catalog or write to the Department of Business Information Systems and Education for further information.

**Business Information Systems and Education Courses**

109. Business Orientation. Orients freshmen and transfer students to College of Business programs, academic and student services, professional organizations, and career possibilities. (1)

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 and 140. (3)

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 wpm required. (3FW,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. (2)
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. (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 (OSD) 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)

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. (3)

300. Principles of Business and Marketing Education. First course in sequence of professional requirements. Includes basic principles of marketing and marketing education, including history, curriculum design, professionalism, and principles of vocational education. (3P)

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)

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)

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, data base concepts, and information systems' analysis, design, and implementation. Prerequisite: BIS 140. (3)

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. Replaces to a maximum of 6 credits. (1F,W,Sp,Sn) ©

330. Database Management. Concepts and methods of defining, creating, and managing data base systems. Principles of management of data resources to support effective information systems in organizations. Prerequisites: BIS 310 and one programming language. (3)

340. Advanced Microcomputer Applications in Business. Provides advanced concepts related to integration of microcomputers into a business organization. Course content will consist of the use of microcomputers to perform business functions. Prerequisite: BIS 140 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, 330, and 440. (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. (1-12P,W,Sp,Sn)

440. Advanced Database Applications in Business. Instruction employing various software designed to make the use of database programs easier and more effective. Prerequisite: BIS 140 or equivalent and programming course. (3)

450. Secondary Curriculum Seminar. Discusses planning, teaching procedures, and evaluation classroom practices to individual differences, testing, and evaluation during student teaching. To be taken concurrently with BIS 460. Prerequisite: admission to teacher education. (3)

460. Student Teaching in Secondary Schools. Prerequisites: admission to teacher education, Psy 366, SecEd 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)

510. Business Information Systems Projects. Design and development of a complete, integrated microcomputer applications system to meet the information needs of a specific business situation. Prerequisites: BIS 340, 410, and 440 or permission of Instructor. (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, 340, 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 and 340. (3)

535 (4635). Business Training Program Design. How to design training programs using a systematic process such as the Critical Events Model. Includes needs analysis, choosing training strategies, and implementing the training program. (3)

536 (6636). Training Program Management. Study of training program management in private and public organizations. Includes working with top management, developing training program budgets, and evaluating training. Suggested prerequisite: BIS 335/635. (3)

541 (6641). Managing Office Technology. Introduces current technologies which impact upon managing office information. Participants will learn about equipment, applications, and management skills which lead to office productivity. (3) ©

545 (6645). Computerized Business Presentations. Designed to utilize computerized presentation capabilities. Participants will use computers to generate and deliver effective presentations. Prerequisite: BIS 340. (3)

555 (6655). 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)

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)

570. Management of Information Systems. Management issues inherent in the existence of the management information systems function. Emphasis on elements that make information systems management different from other organizational functions. (3)
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

Professors Steven D. Aust, Stephen E. Bialkowski, Edward A. McCullough, Jr.; Distinguished Professor Emeritus R. Gauth Hansen; Professors Emeritus William M. Moore, Grant Gill Smith, Jack T. Spence; Adjunct Professors Wilford N. Hansen, Linda S. Powers; Associate Professors David Farrelly, John L. Hubbard, Michael E. Wright; Associate Professor Emeritus Thomas M. Farley; Assistant Professors Ann E. Aust, 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

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) Phys 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: general chemistry (either Chem 121, 122, 123, or Chem 221H and 222H; Chem 124 and 160), physical chemistry (Chem 306, 307, 309, 310), organic chemistry (Chem 331, 332, 333, 334, 335, 336), 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 Phys 221, 222, and Math 220, 221, 320, and 321 or 322.

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; Phys 341, 342, 411, 412, 413, 461, 462, 463, 601; Math 541, 542, 543, 561, 562, 563; Stat 301, 302, 305, 510; or other courses approved by the department. For students planning advanced study in analytical or physical chemistry, Phys 411 is highly recommended.

The BS degree with biochemistry emphasis requires the following additional courses: Chem 308, 371, 564, 565, 670, 671, 672, and Biol 125.

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 Phys 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 Phys 130; Biol 126 or 319 or Micrb 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 upper division chemistry coursework (chemistry courses numbered 300 or above) in addition to Chem 121, 122, and 123 (or Chem 221H and 222H), 124, and 160, or their equivalent, in order to qualify for an approved minor in chemistry. The following courses are recommended: Chem 301, 331, 332, 333, 334, 335, 356, 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.

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1 Some exceptions apply to the Chemistry Teaching major. See detailed major requirement sheet available in the Chemistry and Biochemistry Office.
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.

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. (SF,W,Sp,Su) ©

PS 111. General Chemistry. For non-science majors. Prerequisite: one unit of high school or college algebra. Four lectures and one recitation. (SF,Sp)

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. (SP,W)

PS 122. Principles of Chemistry. Continuation of 121. Three lectures, one recitation. Must be taken concurrently with Chem 122 unless permission is received from instructor. (4W,5p)

123. Principles of Chemistry. Continuation of 122. (3F,5p)

PS 124. Chemical Principles Laboratory. Must be taken concurrently with Chem 122. One three-hour laboratory per week. Prerequisite: Chem 121. (1W,5p)

PS 141. Elementary Organic Chemistry. An introduction to organic chemistry. Prerequisite: Chem 111. (4W,5p,50)

PS 142. Molecules and Life. Designed for non-science majors, this course covers topics relevant to our everyday life. Topics include enzymes, vitamins, hormones, and the molecular basis of disease. (45p)

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,5p)

195. Glass Blowing. (1)

PS 221E, PS 221H. Chemical Principles—Honors. For students who will take additional chemistry courses and who have had high school preparation in chemistry. Series may be taken in lieu of Chem 121-123. Prerequisites: Concurrent enrollment in or completion of Math 220 or equivalent and strong high school preparation in chemistry or permission of instructor. (3F) (3W)

*301. Fundamentals of Physical Chemistry. A lecture survey of basic quantitative laws governing chemical processes. Prerequisites: Chem 141 or 332, Math 105 or equivalent. (4F)


331, 332, 333. Organic Chemistry. A survey of the physical properties, stereochemistry, and reactions of organic molecules. Chem 333 also will include treatment of biologically important molecules. Prerequisite: Chem 123. (3F) (3W) (3Sp)

334. Organic Chemistry Laboratory. Laboratory in general techniques and methods of organic chemistry. Normally to be taken concurrently with Chem 332. Prerequisite: Chem 123, 160. (1W)

335. Organic Chemistry Laboratory. Laboratory in general techniques and methods of organic chemistry. Normally to be taken concurrently with Chem 333. Prerequisite: Chem 334. (1Sp)

336. Organic Qualitative Analysis Laboratory. Two labs. Prerequisites: Chem 332 and 335. (1-2F)

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 332. (45p)

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) ©

533. Advanced Synthesis Laboratory. A laboratory course in practical synthetic methods requiring advanced technique; inert atmosphere, vacuum line, tube furnace, etc. Prerequisites: Chem 335, 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. (3Sp)

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. A laboratory course to accompany Chem 564. Two four-hour labs per week. Prerequisites: Chem 308, 361. (2W)

Graduate

600. Chemical Kinetics. (3F)

601. Quantum Chemistry. (3W)

602. Molecular Spectroscopy and Structure. (3Sp)

625, 626, 627. Advanced Organic Chemistry. (3F) (3W) (3Sp)

629 (E529). Plant Molecular Biology. (4F)

649. Group Theory Preparation for Inorganic Chemistry. (1F)

*650. Inorganic Chemistry of the S and P Block Elements. (3F)

*651. Coordination Chemistry. (3F)

662. Analytical Chemistry. (3Sp)
Department of
Civil and Environmental Engineering
College of Engineering

Head: Professor Loren R. Anderson
Office in Engineering Laboratory 211, 797-2932


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 44.

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 42-45. 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 S 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; EE 270; Econ 200; Engl 101, 201; Geol 111;ITE 227; Math 220, 221, 222, 320, 321, 322; PhyX 221, 222, 223; General Education courses.


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, 288, 363, 387; Biol 125; Econ 200; Engi 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, 350, 351, 364, 365, 367, 369, 388, 420, 487, 543, 561, 570, 573, 578, 580, 588; Soils 358; Pub H 542; 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 WPM. (1W)


224. Engineering Surveying. Principles and methods of engineering surveying including terminology, calculations, areas, volumes, field astronomy, computer analysis, and the use of surveying instruments. Two lectures, two labs, one recitation. Prerequisite: trigonometry. (4Sp)

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) ⋆

288. Environmental Laboratory. Computer simulation lab course stressing reactor hydraulics and kinetics. (2Sp)

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 loads. Prerequisite: Engr 204. (3F, W)

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)

311. 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. (4Sp)

350. 351. Engineering Fluid Mechanics. Fluid properties, hydrostatics, fluid dynamics similarity, 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, 4W)

363. 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. Prerequisite: Chem 122. (3F)

364. Water Supply and Treatment. Application of physical, chemical, biological, and hydraulic principles to water supply and treatment for municipal and industrial uses. Prerequisite: CEE 351 concurrent, CEE 363. (3W)

365. Wastewater Treatment Processes. Application of physical, chemical, biological, and hydraulic principles to the treatment of municipal and industrial wastewater. Prerequisite: CEE 351, 363. (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. Introduces students to the broad subject of how engineering practices within hydrology and hydraulics directly and indirectly affect environmental systems. (3Sp)

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)


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, W, 3Sp) ⋆

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)

507. Design of Steel Structures. Buildings, bridges, framework design. Design project. Prerequisite: CEE 308. (3W)

508 (d610). 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. Finite Element Methods in Civil Engineering. Introduction to finite element analysis covering applications in solid and fluid mechanics. Slope functions, element matrices and vectors, assembling global systems of finite element equations. 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. (3)

522 (d622). Traffic Engineering. Topics 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 Systems Planning and Analysis. Attention focused on defining and evaluating alternatives. Transportation system management (TSM) strategies and the role of decision support systems are explored. (3)

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)
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, 430, and 583. (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/CCE 367. (3Sp)

585. Water Quality Modelling. The theory and application of computer models for evaluating the water quality of rivers and impoundments. Prerequisite: BIE/CCE 367. (3Sp)

586. 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. (3Sp)

587. 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 350; 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. (3W)

590. Cooperative Practice. A planned work experience in industry. Detailed program must have prior approval. Written report is required. (3-9)

596. Management of Regulated Rivers. Political setting of the institutional and regulatory frameworks under which river system flows are altered. Associated environmental consequences of altered flow regimes on the aquatic and riparian ecosystems. Prerequisite: CEE 351 or permission of instructor. (3W)
627. Traffic Flow Theory. (3F)
630. Earth and Rock Fill Dams. (3W)
631. Environmental Geotechnics. (3Sp)
632. Deep Foundations. (3Su)
633. Consolidation Theory and Soil Improvement. (3Sp)
634. Soil Mechanics Laboratory. (3)
635. Retaining Structures. (3W)
636. Shear Strength and Slope Stability. (3F)
637. Buried Structures. (3F)
638 (d538). Earthquake Engineering—Geotechnical. (3Sp)
640. Physical Hydrology. (4F)
641. Surface Runoff Hydrology. (3F)
642. Engineering Risk and Reliability. (3)
643. Groundwater Hydrology. (3F)
645. Hydrologic Modeling. (3Sp)
646. Hydrologic Time Series Analysis. (3W)
647. Groundwater Modeling. (3Sp)
648. Subsurface Contamination. (3W)
653. Steady and Unsteady Hydraulic Modeling. (3Sp)
655. Open Channel Flow. (4F)
656 (d556). Sedimentation Engineering. (3Sp)
**657 (d757). Potential Fluid Flow. (3W)
658. Fluid Mechanics. (4F)
660 (d561). Water Quality Analysis. (4F)
661 (d570). Environmental Management and Regulation. (3F)
662 (d586). Air Quality Management. (3Sp)
663 (d578). Solid and Hazardous Waste Management. (3Sp)
664, 665, 666. Water and Wastewater Treatment. (3F) (4W) (4Sp)
667. Industrial Wastewaters. (3Sp)
668 (d568). Soil Based Hazardous Waste Management. (3F)
669. Water Resources Engineering. (3)
*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 (d742). Water Resources Systems I. (3F)
678 (d743). 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) ®
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)
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 (d554). Spatial Hydrologic Analysis. (3Sp)
758. Advanced Finite Element Analysis. (3Sp)
**759 (d589). 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) ®
Department of
Communication

College of Humanities, Arts and Social Sciences

Head: Associate Professor Scott A. Chisholm
Office in Animal Science 310, 797-3292

Professor Nelson B. Wadsworth; Professor Emeritus Burrell F. Hansen; Associate Professors Gerald L. Allen, Penny M. Byrne, Donald T. Cundy, James O. Derry; Assistant Professor Nancy M. Williams; Adjunct Assistant Professor Andrew Giarelli

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, Media-Management, Public Relations, and Journalism Education

Objectives

The Department of Communication is a professionally-oriented department offering hands-on instruction in journalism, broadcasting, and media management. The department provides the editorial content for the weekly community newspaper, the Cache Citizen, and 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 course. Each student must have an overall GPA of 2.33. Should the overall GPA fall below 2.33, the student will be placed on departmental probation. If the GPA is not raised to 2.33, the student will be dropped as a major from the journalism program. Any student transferring into the department is required to have a 2.33 overall GPA.

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: Comm 302 (take 1 credit per quarter for 3 quarters). 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.


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 2.5.

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 29 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 description. Application for admission to a graduate program is made through the School of Graduate Studies.

Communication Courses

SS 121. Introduction to Mass Communication. 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. Prerequisite: typing ability; Engl 101, 111, or equivalent. (3F,W,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)  

302. Community Journalism. A pre-seminar which explores the processes and problems of news gathering and reporting in local communities. Repeatable to a total of 3 credits. (1F,W,Sp,Su)  

310. Reporting Practice. Lab work in reporting news for print and broadcast media. Must be taken concurrently with Comm 302. Prerequisite: Comm 210. (2F,W,Sp,Su)  


311. Editing and Copy Reading. Laboratory work in editing news copy for style, usage, and presentation. Must be taken concurrently with Comm 302. 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. Prerequisite: PolSci 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. Must be taken concurrently with Comm 302. (2F,W,Sp,Su)  

375. Television Control Room Operations. Lab work in use of control room equipment; includes switching and video taping for operation of cable channel. Must be taken concurrently with Comm 302. (2F,W,Sp)  

383. Newspaper Production Laboratory. Lab course in design, layout, and pasteup of newspapers. To be taken concurrently with Comm 302. 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. Must be taken concurrently with Comm 302. (2F,W,Sp)  

387. Audio Production. Laboratory work in use of voice, music, and sound to create radio programs. Must be taken concurrently with Comm 302. (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. To be taken concurrently with Comm 302. (2W)  

417 (6617). 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)  

453. 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)  


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. Must be taken concurrently with Comm 302. (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)
Graduate

601. Introduction to Mass Communication Graduate Study. (2F,W,Sp,Su)

602. Seminar in Community Journalism. Repeatable to a total of 3 credits. (1F,W,Sp,Su) ®

610. Communication Theory and Technology for International Agricultural Extension. (3Sp)

611. Internship. (1-6F,W,Sp,Su) ®

617 (6417). 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) ®

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 Lifespan Learning Independent Study Division.
*Taught 1994-95.
**Taught 1995-96.

Department of
Communicative Disorders

College of Education

Head: Professor Thomas S. Johnson
Office in Communicative Disorders 102A, 797-1375

Professors James C. Blair, Steven H. Viehweg; Professors Emeritus Frederick S. Berg, Thomas C. Clark, Jay R. Jensen; Associate Professors Beth E. Foley, Jess Freeman King, Sonia S. Manuel-Dupont, Carol J. Strong; Assistant Professors N. Brandt Culpepper, Jaclyn Littlefield; Clinical Assistant Professors Kim Corbin-Lewis, Peggy G. Von Almen, Susan Watkins; Research Assistant Sheryl Y. Spriet; Clinical Instructors Dee R. Child, Anne Elsweiler, Douglas Hart, Janet K. Jensen, Jan Kelly-King, Ann B. McKeehan, Elizabeth Parker; Research Instructors

Dorothy L. Johnson, Elizabeth Morgan, Lori Rowan; Adjunct Clinical Instructors Kathryn Snyder-Gantz, Sandra Bowen

Degrees offered: Bachelor of Science (BS) in Communicative Disorders; Master of Science (MS), Master of Education (MEd), and Master of Arts (MA) in Communicative Disorders with emphasis in Educational Audiology or Speech-Language Pathology; MEd in Education of the Deaf and Hard of Hearing; Educational Specialist (EdS) in Educational Audiology

Objectives
Three major objectives of the Department of Communicative Disorders are (1) to train competent speech-language pathologists,
educators of the deaf and hard of hearing, and clinical-educational audiologists capable of state and national certification; (2) to provide clinical services to speech-language or hearing impaired individuals in the University population or in the community; (3) to provide a research opportunity for those 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 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 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 before the junior year (see College of Education requirements). This approval is necessary for the student to take certification courses taught in the departments of Elementary Education, Special Education, 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 Com D 240, 270, 310, 312, 322, 365, 375, 381, 380, 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, as directed by the department. The department has an undergraduate adviser for this program.

There is no teaching minor offered in communicative disorders. 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 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 varieties of language and speech disorder. (3F,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, resonance, articulation, hearing, and fundamental neurology. Prerequisite: Phys 130 or consent of instructor. (3F)

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: Com D 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 Total Communication. Basic receptive and expressive use of sign language as used in the American Sign Language system. (3F,W,Sp)

353. 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. (3W)

381. Hearing Science. Study of the physics of sound and its interaction with people. Basic concepts of wave forms, decibel notation and sound measurement, sound propagation, aural harmonics, adaptation, and masking. (3W)
497. Senior Thesis. Student-initiated research project under faculty supervision. Prerequisites: satisfactory grade point average, instructor recommendation, and approval of Honors Committee. (1-4F, W, Sp, Su) ©

500. Institute in Communicative Disorders. Special colloquial offerings in communicative disorders. (1-5F, W, Sp, Su)

507. Speech Science. Contemporary theory, research findings, clinical applications, and laboratory experiences in measurement and analysis of speech production. (3Sp)

510 (d609). Grammar and Language of Speech. Prerequisites: satisfactory grade point average, instructor recommendation, and approval of Honors Committee. (1-4F, W, Sp, Su) ©

528 (d628). Educational Audiometry. 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)


542. Internship in Audiology. Supervised diagnostic and remedial practicum with individuals having hearing loss. Prerequisite: consent of instructor. (1-5F, W, Sp, Su) ©

549 (d449). Evaluation of Language Disorders. Evaluation of the language and communication skills of prelinguistic, preschool, and school-age children, using formal and informal assessment procedures. Prerequisites: Com D 270, 510, or equivalents. (SF)

551 (d652). Remediation of Language Disorders. 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: Com D 549. (3W)


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. Specialized signs used in academic settings will be taught. Methods for using all systems (signs, speech, audition) simultaneously will be presented. (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 Intelligibility Audiology. Provides understanding of theory and application of intelligibility audiology 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) ©
102 Computer Science

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. (SF)
681. Management of Voice Problems. (4)
684. Motor Disorders of Speech and Swallowing. (4F)
685. Seminar in Communicative Disorders. (2F, W, Sp, Su)
687. Hearing Aids. (SF)
688. Electrophysiological Auditory Tests. (SSp)
689. Assessment and Educational Services for the Bicultural/Bilingual/Bidialectal Child. (3W)
690. Independent Study. (1-12F, W, Sp, Su) ®
691. Independent Research. (1-3F, W, Sp, Su)
692. Advanced Hearing Aids. (3F)
693. Advanced Clinical Audiology. (3W)
696. Master's Project. (2-6F, W, Sp, Su) ®
698 (ES90). 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)
799. Continuing Graduate Advisement. (1-12F, W, Sp, Su) ®

1. Parenthetical numbers preceded by a d indicate a dual listing; parenthetical numbers preceded by an f use 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

Professors Emeritus Rex L. Hurst, Wendell L. Pope; Associate Professors Stephen J. Allan, Vicki H. Allan, Scott R. Cannon, 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.

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 86 for additional details.

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) Phys 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

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.

To remain in good standing, students pursuing a major in the department must maintain a GPA of 2.5 or better. In addition, before a student can register in 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.

Requirements for a Bachelor of Science degree

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 COURSES1

Science Option

CS 170, 171, 172, 220, 227, 327, 355, 356, 410, 427, 470, 510; Stat 301; Math 220, 221, 222, 320, 321, 322, 461 or 463; 3 three-course track electives2; one quantitative/scientific methods course3

Digital Systems Option

CS 170, 171, 172, 220, 225, 327, 356, 410, 427, 470, 510; EE 211, 212, 251, 252, 311, 312, 352, 358, 487, 588; Math 220, 221, 222, 320, 321, 322, 331, 461; Stat 301; 2 three-course track electives; one quantitative/scientific methods course

Information Systems Option

CS 170, 171, 172, 220, 227, 327, 355, 356, 410, 427, 470, 510, 517, 518, 527, 549, 575, 576; Acctg 201, 203; Stat 301; BA 308; MHR 311; Econ 200 or 201; Math 220, 221, 222, 331; BIS 310, 570; 1 three-course track elective; 2 300-level or above courses selected from the College of Business with written adviser approval

Elective courses (3 credits minimum): CS 170, 221, 227, 241, 251, 327, 355, 356, 541; BIS 310, 570, 370; 1 three-course track elective; 2 300-level or above courses

1Changes or additions to these requirements may occur from time to time. Students are required to contact the department office for current requirements.
2Contact the department office for a listing of track electives.
3Contact the department office for a listing of quantitative/scientific methods courses.

Minors

Minors are offered with emphasis in three 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, 227, one additional CS class numbered 400 or above

Information Systems

(for the business major)

CS 170, 171, 172, 220, 252, 517, 518

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 (26 credits):

CS 150, 170, 171, 172, 220; Ins T 516, 524

Elective courses (3 credits minimum):

BIS 140; CS 101, 227, 241, 251, 327, 355, 356, 541; Ins T 617, 619, 625, 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. This course introduces the student to the use, nature, history, and impact of computers in modern life. It has no prerequisites. (4F,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. (4F,W,Sp,Su)


SK 170. Computer Science I. Introductory concepts of programming in PASCAL, historical and ethical aspects of computing, elementary data structures, algorithm design and analysis. Prerequisite: CS 160 with co-requisite Math 106, or instructor's permission. (4F,W,Sp,Su)

SK 171. Computer Science II. Advanced programming in PASCAL, complex data structures and algorithms, recursion, software development concepts, mathematical and scientific applications of computing. Prerequisites: CS 170; Math 220 or 215. (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)

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 172. (4W,Sp)

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: prior programming experience or permission of instructor. (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,Su)

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, 241, or 251; CS 355 or EE 251 is required for 356. (4W) (4Sp)


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,Sp)
474. 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,Sp)

471. Topics in Computer Science (Topic). Special topics class for undergraduates. Prerequisite: permission of instructor. (1-6F,W,Sp,Su)

495. Undergraduate Research. The student will participate in research projects and study developments and material not available in current coursework. Prerequisite: permission of instructor. (1-3F,3W)

505. Parallel Programming. Programming methodologies for highly parallel computers. Topics include concurrent programming, distributed programming, and implementation issues. Prerequisite: CS 410. (3F)

507 (6607). Algorithms for Digital Signal Processing. A study of algorithms essential to digital signal processing applications. Topics will include Fourier transforms, convolution, digital filters, and estimation. Speech recognition techniques will be examined. Prerequisites: CS 172 and Math 222. (3F)


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. (5Sp)

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: statistical methods and computer programming. (3Sp)

527 (6627). Software Engineering. Advanced techniques for software development, concentrating on project management, analysis, specification, and design. Prerequisite: CS 427. (3F)


541, 542. Computer Graphics. A two-quarter sequence introducing the concepts of graphics techniques and digital representation of information. Prerequisites: CS 172 or 260 or consent of instructor; CS 541 must be taken prior to 542. (3F)(3W)

549. Expert Systems—Principles and Applications. Inference, automated reasoning, knowledge representation and acquisition, and hands-on experience in expert system construction and evaluation are included in this stand-alone course. Prerequisite: familiarity with a high-level programming language or permission of instructor. (3Sp)

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)

560. Artificial Intelligence Programming. 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 or consent of instructor. (3F)

575. Telecommunications. An introduction to data communications concepts and terminology, distributed computer systems, public and private communications services, and local area networks. Prerequisite: junior standing. (3W)

576. Data Communications. Representations of data, network architectures and protocols, standards, applications, and performance measures. Prerequisites: CS 227 and 575, Math 222. (3Sp)

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. (3Sp)


610. Operating Systems. (3F)

615. Theory of Relational Database Systems. (3Sp)

616. Structured Systems Analysis and Design. Prerequisites: CS 517 and 518. (3Su)

625. Cooperative Work Experience, Graduate. (1-9F,3W)

627 (4527), 628, 629. Software Engineering. (3F) (3W) (3Sp)

632. Supercomputers for Supercomputers. Prerequisite: CS 531. (3F)

633. Optimizations for Parallel Processors. (3W)

641. Advanced Computer Graphics. Prerequisite: CS 542 or permission of instructor. (3Sp)

650. Artificial Intelligence I. (3W)

651. Artificial Intelligence II (Advanced Topics). (3Sp)

652. Computer Vision. (3W)

653. Pattern Recognition. (3Sp)

654. Theory and Application of Neural Networks. (3W)

671. Topics in Computer Science (Topic). Prerequisite: CS 220 or permission of instructor. (1-3F,2W,3Sp,3Su)

690. Seminar. (1-5)

695. Reading and Reports. (3-6)

697. Thesis and Research. (1-9)

699. Continuing Graduate Advisement. (1-3)

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4Parenthetical numbers preceded by a denote a dual listing.
5Descriptions for courses in the 600 and 700 series can be found in the graduate catalog.
6Not 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.
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, Rondo A. Christensen, 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, Lynn H. Davis, Allen D. LeBaron, N. Keith Roberts, Morris H. Taylor; **Associate Professors** Larry K. Bond, L. Dwight Israelsen; **Associate Professor Emeritus** Glenn F. Marston; **Assistant Professor** Christopher Fawson; **Human Resources Specialist** Marion T. Bentley

**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 Agricultural Industries (MAD); Master of Social Science (MSS); Doctor of Philosophy (PhD) in Economics (may have emphasis in Agricultural Economics, International Economics, or Finance)

**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, Prew 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 2.2 to be accepted as majors in Agricultural Economics, Traditional Economics, and Prew 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) 452-8615; or (3) consult with the departmental undergraduate academic advisor 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: Accctg 201, 203; BIS 140; Econ 200, 201; Math 105, 215; Stat 230 (Agribusiness), or Stat 301 and 502 (Agricultural Economics).

To prepare for taking upper division economics, business, and management classes, majors in Economics should complete the following prespecialization courses or their equivalent: Accctg 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 2.5, qualifies a student for Advanced Standing, a requirement for graduation in 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.*
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 180 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 University and prespecialization requirements listed above, plus BIS 255 or ASTE 305 or Engl 305; Econ 331, 400, 401, 402, 403, 502, 503, 504, 531, 532, 533, 540; 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 340 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.


Minor in Agribusiness Management. The requirements for a minor in Agribusiness Management are Accgt 201; Econ 201, 303 or 403, 403, and 533; plus two of the following courses: Econ 331, 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 Accgt 201, 203; BA 308, 340, 350, 370; BIS 140, 340; Econ 200, 201, 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 340 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 Accgt 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 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 340; 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 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, 500, and 501; plus three of the following courses: 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 400 or 500, 401 or 501, 510, 530; Econ 395, or Econ 485H and 495H; plus an additional 20 credits in economics courses numbered 300 or above; BIS 340; PolSci 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 400, 401, 531, 532, 533, 540; Econ 395, or Econ 485H and 495H; plus an additional 15 credits in Economics courses numbered 300 or above; BIS 340; 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 three of the following courses: 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. (1)

SS 201. Economics II. Designed for any student. Economics of the marketplace, analysis of issues surrounding our business and consumer institutions. (5F,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)

255. Economies and Man's Environment. Familiarizes nonmajors with economics and the impact of economic systems, primarily the free market, on world resources and environment. (4Sp)

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. (3P)


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: Acctg 201, and BUS 140 or ASTE 309. (3W)

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 Acctg 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)

487. History of Economic Thought. Origin and development of economic theories of leading thinkers in Western civilization from 1750. (3W)


510. History of Economic Thought. Origin and development of economic theories of leading thinkers in Western civilization from 1750. (3W)


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. (3Sp)

515. Comparative Economic Systems. History, economic theories, and comparative policies of communist, socialist, and capitalist economies. (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,Sa)

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)

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. (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 (633). Applied Econometrics. Application of basic statistics, simple linear regression, multiple regression, and simultaneous equations to economic models. Prerequisites: Math 215 or equivalent; Econ 531 or its equivalent; Stat 230, or Stat 301 and 502, or their equivalent; or consent of instructor. (3Sp)

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 Acctg 201; or consent of instructor. (3Sp)

540. International Economics. Primary issues in international economics including comparative advantage, trade restrictions, balance of payments, and alternative international monetary mechanisms. Prerequisite: 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)

588. Regional and Urban Economics. Building on microeconomic theory, models for regional and urban structure and change are explored. Policy decision models are also developed. (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. (3Sp)

Graduate

600. Income Theory. Prerequisite: Econ 500 or consent of instructor and applied calculus, Econ 531, or its equivalent. (4F)

601. Price Theory. Prerequisite: Econ 501 or consent of instructor and applied calculus, Econ 531, or its equivalent. (4W)

602. Economic Production and Policy. Prerequisite: Econ 501, 531, Math 215 or their equivalent; or consent of instructor. (3W)

603. Agricultural Marketing and Policy. Prerequisite: Econ 501 or consent of instructor. (3Sp)

606. Research Methods I. (3W)

620. Labor Economics: Contemporary Problems in Human Resources. Prerequisite: Econ 522 or consent of instructor. (3Sp)

625. Graduate Internship. (1-6F,W,Sp,Su) ©

626. Economics of New Work Systems. (3F)

631. Advanced Mathematical Economics. Prerequisites: Math 105, 215, Econ 501, 531. (3W)

633 (d333). Applied Econometrics. Prerequisites: calculus; Econ 531 or its equivalent; Stat 230, or Stat 301 and 502, or their equivalent; or consent of instructor. (3Sp)

640. International Economics. Prerequisite: Econ 540 or consent of instructor. (3Sp)

643. Econometrics I. Prerequisites: calculus and statistics, or consent of instructor. (3F)

644. Econometrics II. Prerequisite: Econ 643 or consent of instructor. (3W)

645. Operations Research. Prerequisites: Econ 531 and 532; BA 308 or equivalent; or consent of instructor. (3Sp)

647. Business Forecasting Methods. Prerequisites: Math 215 and Econ 531 or their equivalent; Stat 230, or Stat 301 and 502, or their equivalent; or consent of instructor. (3Sp)

656. Resource Economics. Prerequisite: Econ 501 or equivalent, basic calculus (Econ 531 or its equivalent), or consent of instructor. (3F)

666 (d566). Training and Organizational Development. (3Sp)

680. Economic Development. Prerequisite: Econ 580 or consent of instructor. (3W)

687 (d487). Economics for Teachers. Econ 200 and 201 are recommended prerequisites. (3F)

690. Readings and Conference. (1-5F,W,Sp,Su) ©

691. Independent Research. (1-5F,W,Sp,Su) ©

697. Thesis. (1-12F,W,Sp,Su) ©

699. Continuing Graduate Advisement. (1-3F,W,Sp,Su) ©

700. Advanced Macroeconomics Seminar. Prerequisite: Econ 600 and Math 631, or consent of instructor. (3Sp)

701. Price Theory I. Prerequisites: calculus, Econ 631 or its equivalent, and Econ 601 or consent of instructor. (3Sp)

720. Topics in Applied Microeconomics. Prerequisite: Econ 700, 701, and 733, or consent of instructor. (3F)

733. Advanced Econometrics Seminar. Prerequisites: calculus, Econ 631, 643, 644, or their equivalent; or consent of instructor. (3Sp)

755. The Economics of Natural Resource Use Seminar. Prerequisites: calculus, Econ 601, 656, and Econ 631 or its equivalent. (3W)

760. Seminar in Financial Topics. (3)

780. Economic Development/Trade Seminar. Prerequisites: Econ 640 and 680. (3F)


799. Continuing Graduate Advisement. (1-3F,W,Sp,Su) ©

1Parenthetical numbers preceded by © indicate a dual listing.
2Descriptions 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 Life Span Learning Independent Study Division.
*Taught 1993-95.
**Taught 1995-96.
Department of

Electrical 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, George Czerlinski, James C. Ulwick; Adjunct Professors Stephen E. Bialkowski, Douglas M. Chabries, Boyd P. Israel; Emeritus Professors Emeritus Clayton Clark, Larry S. Cole, 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 Scott E. Budge, Todd K. Moon, Charles M. Swenson; Research Assistant Professors L. Carl Howlett, Larry L. Jensen, Stephen B. Turcotte; Adjunct Assistant Professors Ali Ghafourian, Chien-Min Huang; Research Engineer Paul D. Israel

Degrees offered: Bachelor of Science (BS), Master of Engineering (ME), Master of Science (MS), and Doctor of Philosophy (PhD) in Electrical Engineering

Objectives

The Department of Electrical 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) to assure professional status to the graduates of this department. 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 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 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 advanced program can be categorized into three basic areas: (1) electronics and instrumentation systems, semiconductors, integrated micro-circuits, analog and digital electronics, computers, electrooptics, electromechanics, and cryogenics; (2) information, communication, and control systems, information transmission and signal processing systems, automated systems, spectral analysis, computer-aided modeling, simulation, and optimization techniques; and (3) electrical energy, electromagnetic radiation, propagation and reception, optical/infrared engineering, particle and photon emission and detection, energy conversion, machines, and power distribution systems.

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 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.

In cooperation with other departments, all EE 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 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 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 EE and technical electives are available from the Electrical Engineering Department.

Preprofessional Program

Freshman Year: Math 220, 221, 222; CS 170, 171, 172; Chem 121; Phyx 221; Engr 187; EE 188; Engl 101; and General Education electives.

Sophomore Year: Math 320, 321, 322; Phyx 222, 223; EE 211, 212, 251, 252; Engl 201; and General Education or technical electives.

Professional Program

Junior Year: EE 308, 310, 311, 312, 313, 314, 315, 346, 347, 352, 358, 375, 391, 392, 401; and Econ 200.

Senior Year: EE 480, 487, 491, 492; 12-21 credits EE electives; 6-15 credits engineering science electives; 5-14 credits 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 flown on the Space Shuttle. USU's world famous space program was spawned by the Electrical 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 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 Engineering Department are active in high-tech water resource management.

Graduate Study

The Department of Electrical Engineering offers the following degrees: Master of Engineering (ME), Master of Science (MS), and Doctor of Philosophy (PhD) in Electrical Engineering. See the graduate catalog for information on these programs.

Electrical 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 WPM. (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 EE 212. (4W,Sp) (4F, W)

225. Introductory Internship/Coo-op. An introductory-level planned work experience in industry. Detailed program; must have prior approval. Written report required. (3F,W,Sp,Su)

251, 252. 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. (3F,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: EE 211. (3F,Sp)

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: EE 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: EE 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. EE 314 must be taken before EE 315. (3W) (3Sp)

316. Electromagnetics for Computer Engineering. High frequency electromagnetic principles and applications in the analysis and design of high-speed computers and computer networks. (3Sp)

346, 347. Electronic Analysis and Design. Introduction to semiconductors, diodes, transistors, amplifier circuits, operational amplifiers, and integrated circuits. Three lectures, one lab. Prerequisite: EE 212. (4F,W) (4W,Sp)

352. Microcomputers. Microprocessor architectures, instruction sets, and assembly language programming with emphasis on software design techniques. Three lectures, one lab. Prerequisites: EE 292, CS 171. (4F,Sp)

388. 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: EE 352. (4W,Sp)

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. PID+, D, F grading. (1F,Sp) @

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: EE 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: EE 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. (3Sp)

480. Applied Electronics. Electronic devices and circuits for instrumentation, communication, control and power applications. Three lectures, one lab. Prerequisite: EE 347. (4F, Sp)

487. Digital System Design. Design of advanced digital systems, including signal definition, functional partitions, and system controllers. Design implementation with programmable logic devices and software design tools. Three lectures, one lab. Prerequisite: EE 358. (4F, Sp)

491. Design II. Individual or team engineering project, including design, development, and testing. Written reports required. Prerequisite: EE 392 and senior standing. (2F, W, Sp, Su)

492. Technical Reporting. Written and oral reports describing technical details of design project. Prerequisite: EE 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. (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: EE 313. (4F) (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: EE 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: EE 211 and 251. (3Sp)

540, 541. Microwave Electronics. Circuit parameters and design techniques for distributed circuits, active and passive microwave devices. Three lectures, one lab. Prerequisites: EE 315 and 347. (4F) (3W)

542. Antennas and Radiation. Theory and applications of electromagnetic radiation and radiative structures. Three lectures, one lab. (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: EE 312. Three lectures, one lab. (4F)

555. 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: EE 358. (4Sp)


581. Applied Electronics. Electronic circuits and systems analysis and design of integrated circuit devices. Three lectures, one lab. Prerequisite: EE 480. (4W)

586. Computer Structure. Theory and organization of computer structures: number representations, computer arithmetic, processors, control units, memories, interconnection networks, parallel architectures, and performance trade-offs. (3F)

588. Microcomputer Interface Design. Design of hardware and software interfaces to microcomputers for instrumentation and control applications. Three lectures, one lab. Prerequisite: EE 358. (4Sp)

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

601. Stochastic Processes in Electronic Systems. (3F)

607 (5507), 608. Very Large Scale Integrated Circuit Design. (4W) (3Sp)

611 (5710), 612. Optical Engineering. (3F) (3W)

620, 621, 622. Microwave Engineering. (3W) (3Sp) (3)

625. Graduate Internship/Co-op. (3W) (3F, W, Sp, Su)

631. Space Science and Engineering. (3W)


642. Analog VLSI Design. Prerequisites: EE 506 and 581. (3)

650. Digital Image Processing. (3W)

652, 653. Control Theory. (3F) (3W)

**657, **658, **659. Applied Plasma dynamics. See Phys 657, 658, 659. (3F) (3W) (3Sp)

661, 662. Electromagnetics. (3W) (3Sp)


687, 688. Computer Structure. (3W) (3Sp)

693. Special Topics in Electrical Engineering. (3F, W, Sp, Su)

695. Design Project. (3F, W, Sp, Su)


699. Continuing Graduate Advisement. (1-12F, W, Sp, Su)

701, 702, 703. Aeronautics. (3) (3) (3)

704. Ionospheric Physics. See Phys 704. (3)


**711, 712. Electro-optics. (3)

732. Space Science and Engineering. (3W)

742, 743. Design and Analysis of Advanced Integrated Circuits. (3) (3)

750. Advanced Digital Signal Processing. (3W)

751. Advanced Digital Image Processing. (3Sp)

752, 753. Advanced Control Theory. (3Sp) (3Sp)

764, 765. Digital Computer Architecture. (3)

770, 771. Communications and Signal Processing Theory. Prerequisite: EE 601 must be taken prior to EE 770. (3W) (3)

793. Special Problems in Electrical Engineering. (1-9F, W, Sp, Su)


799. Continuing Graduate Advisement. (1-12F, W, Sp, Su)

1Descriptions for courses in the 600 and 700 series can be found in the graduate catalog.

2Parenthetical numbers preceding by are the former course numbers.

*Taught on demand.

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

*Taught 1994-95.

**Taught 1995-96.

Electrical Engineering 113
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 Donald R. Daugs, Bernard L. Hayes; Associate Professors Deborah A. Byrnes, Francine F. Johnson, Deanna D. Winn; Assistant Professors Martha T. Dever, James T. Dorward, Linda W. Ginn, Deborah E. Hobbs, Elizabeth J. Jared, John A. Smith, 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 Lecturers Gloria J. Bell, Janet M. Dovedale

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; Doctorate of Philosophy in Education (PhD) or Doctorate of Education (EdD) with emphasis in Elementary Education; Certification Endorsement in Early Childhood Education, Middle Education, Gifted and Talented Education

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 41). 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, 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.

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 advisor 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, 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 April 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. (1-6F,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 attitudes in science. Prerequisites: admission to teacher education; completion of Level II; and Biol 101, Chem 101, Geol 101, and Phy 120 or their equivalents; must be taken prior to Level III. (3F,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 Ed Ed 110. (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). 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

600 (d500). Managing Student Behavior. (3)

604. Measurement and Evaluation in Education. (3W,Sp)

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. Preparing Inservice Educators for Implementation of Middle School. (3-12)

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) ©

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 Life Span Learning 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

Professors Jay Anderson, Jan Bakker, Kenneth B. Hunsaker, Joyce A. Kinkead, Thomas J. Lyon, Willis L. Pitkin, Jr., Reed C. Stock, Barre Toelken; Associate Professors Theodore Andrea, Kate M. Begnal, Kenneth W. Brewer, Patricia Gardner, Sonia S. Manuel-Dupont, Jan E. Roush, John A. Scherting, Ronald R. Shook, Steve Siporin, Dean O. Skabelund; Assistant Professors David B. Arnett, John McLaughlin, Anne Shifer, Roberta S. Stearman; Lecturers John A. Butler, 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 (1) to receive experience in and understanding of literature, (2) to gain competency in writing, and (3) to acquire an insight into the nature of language. Such a program allows students to develop strong communication skills, the ability to think critically, the capacity to research, analyze, interpret, reorganize, and rephrase material, the capacity for greater sensitivity to and interest in human experience, and a greater knowledge of foreign cultures. The emphasis on literature, language, and culture, on writing, reading, and reasoning skills, also fosters an ability to adapt to changing situations, to learn and retrain, and to work creatively. Such skills thus prepare the student for demanding and unpredictable professional careers in writing, editing, and publishing; in law, business, industry, the military, and government; and 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 41 and 206 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 2.5 for admission to the English major.

All English majors and minors must maintain a 2.5 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

Core Requirements. All English majors are required to complete the following courses as soon as possible before enrolling in a 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 (prerequisite: Engl 109), 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 language/linguistic courses: Engl 210 or 453, Engl 409, Engl 509 or 510; (2) 15 credits in writing content courses: Engl 301, 302, 305, 306, 413, 501, 502, 427 or 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 (prerequisite: Engl 109), 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, Engl 587 or 588, 6 credits of American literature, 6 credits of British literature, 3 credits in the literature of other cultures, 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 116, 251, Engl 260 or 261, Engl 401 (Engl 301 or SecEd 306 is a prerequisite), Engl 405, 410, 417, 418, Engl 587 or 588; and SecEd 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,Su) 0

Lower Division

WC 101. English Composition. Developing writing strategies and skills in fluency and revision. (3F,W,Sp,Su)

WC 105. Vocational English. Writing in such specialized forms as letters, resumes, and reports; for one- or two-year vocational students. (3)

109. Elements of Grammar. Study of sentences and sentence-types to prepare students for editing tasks and tests. (3) 0


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)


372 (d672). 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 Language Analysis. Overview of the rule-governed behavior of language with emphasis on phonology, syntax, morphology, and semantics. (3)

410. Grammar. A comprehensive study of traditional, structural, transformational systems of grammatical analysis with some attention to grammar for prospective teachers. Prerequisite: Engl 109. (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)

428. 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 their 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 SecEd 460. (3F,W,Sp)

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,Sa) ®

487. Theory and Application of Electronic Texts. Examines electronic texts in their cultural contexts and explores the creative and empowering potential of such texts. (3F,W,Sp,Sa)

492. Senior Practicum. (1) ®

501 (d606). Advanced Poetry Writing. Advanced practice in writing poetry. Prerequisite: Engl 306 or equivalent. (3) ®

502 (d603). 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. Applications in Linguistics. Study of language in context: historical, developmental, dialectical language changes, social and pragmatic uses of language, written and oral communication. Recommended prerequisites: Engl 409 and 410. (3)

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) ®

526. Legends, Myths, and Folktales. Substance and significance of folk prose narratives both in the past and in contemporary society. (3)

529. Seventeenth and Eighteenth Century World Literature. (3)

530. Nineteenth and Twentieth Century World Literature. (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) ®

551. 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 publications 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)

591. 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

600. Bibliography and Research Methods. (3)

602 (d603). Advanced Fiction Writing. (3) ®

604 (d504). Advanced Essay Writing. (3) ®

605. Rhetoric and Basic Writing. (3)
Focus within majors: Family and Human Development includes Human Development emphasis and Marriage and Family Relationships emphasis; Early Childhood Education includes certification K-3rd grades.

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, and this may be done in a variety of ways. Practicum experiences are currently available in the Primary Children's Medical Center, Logan Regional Hospital, public schools, Bear River Mental Health, CAPSA, Children's House, Adele and Dale Young Child Development Labs, Family and Child Support Center, child care centers, Planned Parenthood, safe houses, research programs, and others as arranged between the student and the department. Those students majoring in early childhood education complete a formal internship in the Adele and Dale Young Child Development Labs and primary grades as a part of this focus. In addition, the Adele and Dale Young Child Development Lab setting can be used by other students in the department to complete practicum requirements.

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 Home Economics Association. Certification in Early Childhood Education is also available.

Requirements

Departmental Admission Requirements. Admission requirements for the Department of Family and Human Development are the same as those described for the University on pages 8-11. Students entering the Family and Human Development (FHD) Major with less than 45 college credits must have a 2.0 total GPA. Students applying for entrance to the FHD Major, who have more than 45 college credits, must have a total GPA of 2.5 or more to be admitted into the major. A minimum GPA of 2.67 in the major (departmental requirements only) is required for graduation.

College Requirements. All majors must complete the basic College of Family Life curriculum for common understanding (see page 47). 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.

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 415.

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, or Marriage and Family Relationships: FHD 370 and 425.

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.

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.

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 and recommended electives. 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**

425. Internship. Placement experience in applying skills and knowledge in community agencies. One credit for 30 hours of experience. Senior standing. Apply two quarters in advance. (1-12F,W,Sp,Su)

431. Women and Men. Women and men in the family, in society, and in relationships with each other. (3)

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. Prerequisite: FHD 150. (3F,Sp)

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. Prerequisite: FHD 150, 250, 455. (3-6F, W, Sp, Su)

490. Independent Study. (1-6F, W, Sp, Su) ©

550. Interdisciplinary Workshop. (1-3F, W, Sp, Su) ©

561. Introduction to Software Usage. Basic operating system usage, word and graphic processing for VAX, IBM compatibles, and Macintosh systems. (1F, Sp)

565. Parenting and Family Life Education. Methods and theories in family life education, applied to current parenting issues. (3)

**Graduate**

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) ©

630. Family Therapy Theories I. (4F)

631. Family Therapy Theories II. (4F)

632. Family Therapy Theories III. (4F)

637. Ethics and Professional Issues in Human Development, Family Relations, and Family Therapy. (3W)

638. Analysis and Treatment of Human Sexual Dysfunction and Dissatisfaction. (4F)

639. Assessment in Marital and Family Therapy. (4W)

641. Social Change and the Family. (3Sp)

650. Family-child Interaction. (3W)

654. Moral Development in the Family. (3Sp)

662. Using and Interpreting SPSSX to Analyze Social Research Data. See instructor before enrolling. (3F, Sp)

670. Family Theory. (3W)

675. Research Seminar in Family and Human Development. (1-3F, W, Sp, Su) ©

677. Aging and the Family. (3Sp)

680. Research Methods. (3Sp)

681. Methodological Designs in the Study of Change. Prerequisite: FHD 680 or equivalent. (3W)

683. Personality and Social Development in Adolescence. (3Sp)

684. Family and Peer Relations During Adolescence. (2-3W)

685. Family Health and Social Problems During Adolescence. (2-3Sp)

686. Infancy. (3F)

687. The Preschool Child. (3W)

688. Middle Childhood. (3Sp)
### 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, John A. Kadlec, Frederic H. Wagner, Michael L. Wolfe; **Professors Emeriti** Jessop B. Low, John M. Neuhold, William F. Sigler, Allen W. Stokes; **Associate Professors** Michael R. Conover, Charles P. Hawkins, Wayne A. Wurtsbaugh; **Associate Professor Emeritus** Gar W. Workman; **Assistant Professors** Todd A. Crowl, Thomas C. Edwards, Jr., Barrie K. Gilbert, Chris Luecke, Terry A. Messner, Mark E. Ritchie, Robert H. Schmidt; **Research Associate Professors** Martha H. Balph, Frederick F. Knowlton; **Research Assistant Professors** David A. Beauchamp, Jeffrey L. Kershner; **Adjunct Assistant Professor** Ronald W. Goede

**Associated Units:** Cooperative Fish and Wildlife Research Unit, Predator Ecology and Behavior Project, and U.S. Forest Service Cooperative Fish and Wildlife Habitat Relationships Unit

**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 programs of emphasis in Fisheries Management, Wildlife Management, Populations, Behavior, Wildlife Ecology, Aquatic Ecology, Conservation Ecology, and Problem Wildlife Management

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**Objectives**

The Department of Fisheries and Wildlife provides undergraduate training for careers in the management of wildlife and fishery resources. The department's philosophy is to promote a broad interdisciplinary approach to natural resources problems 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 51. Students in good standing may apply for admission to the department.

**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, RS 300, or WS 300; the September Workshop (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; Physl 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 21-26, and Liberal Arts and Sciences Program, pages 34-35.)

The Fisheries and Wildlife curriculum is currently under revision. Students should confer with a departmental adviser for...
recent changes in requirements. 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, page 52.

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. (25p)

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)


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. (SSp,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. (4Sp)

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. (1Sp)

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)

315. 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 386, Math 216. (3W)

350. General Fishery Biology. This course is offered only through the Life Span Learning Independent Study Program. (5)

385. Field Ecological. 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. Prerequisites: Biol 125, 126, 127, or permission of instructor. (4F,W)

387. Techniques in Fishery 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 apprehensions 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. (1-5F,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; Phys 120. (5W)

462. Aquatic Ecology Laboratory. Field and lab techniques for determining community structure, metabolic parameters, and nonbiotic factors of the aquatic habitat; use of equipment; and analysis of data. Prerequisites: FW 460, Stat 201. (3Sp)

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, 2W, 3Sp)

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. (3Sp)

514. Selected Topics in Problem Wildlife Management. Seminar course with guest speakers who are authorities in various aspects of problem wildlife management. (4Sp)

519. Habitat Relationships in Managed Forests. Ecological relationships, management concepts, and policy influencing fish and wildlife habitats in managed forests. (3F)

520. Predator Ecology and Management. Introduces students to interactions between predators and prey. They can apply this knowledge to unique problems of managing vertebrate predators. (3F)

525. 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)

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. (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 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)

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. (3Sp)

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

601. Advanced Fisheries and Wildlife Program Administration. (3F)
Department of

Forest Resources

College of Natural Resources

Head: Professor Terry L. Sharik
Office in Natural Resources 208, 797-3219

Professors James J. Kennedy, Ronald M. Lanner, Jesse A. Logan, James N. Long, H. Charles Romesburg; Adjunct Professor Roy C. Sidle; Professors Emeritus T. W. Daniel, Raymond R. Moore; Associate Professors Frederick A. Baker, Jr., Michael J. Jenkins, David W. Roberts; Adjunct Associate Professor Norbert V. DeByles; Associate Professor Emeritus Carl M. Johnson; Assistant Professors Dale J. Blahna, Mark W. Brunson, Joanna L. Endter-Wada, Michael R. Kuhns, Robert J. Lililholm, Heiga Van Miegroet; Research Assistant Professor Leila McReynolds Shults; Adjunct Assistant Professors Barbara J. Bentz, John L. Crane, Jr.; Instructor Michael F. Butkus

Degrees offered: Bachelor of Science (BS), Master of Science (MS), and Doctor of Philosophy (PhD) in Forestry; BS, MS, and PhD in Recreation Resource Management; Master of Forestry (MF) in Forest Management; MS and PhD in Ecology (Forest); BS in Environmental Studies

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 and PhD degrees in Forestry have areas of emphasis in Forest Management, Recreation Resources Management, Forest Biology, Forest Economics and Policy

Objectives

The major instructional goal of the Department of Forest Resources is to provide an excellent professional program in multiple-use management of natural resources and quality graduate programs in specific disciplines. To that end, the department continually evaluates and upgrades courses and curricula in response to changes in the profession and to 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 solution, to maintain an active program of continuing education, extension, and outreach, and to provide for continuing faculty development.

The department's curricula are aimed at providing a sound general education, as well as a firm grounding in professional subjects. The forestry and recreation resource management curricula and the Master of Forestry curriculum 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. They provide professional training in all aspects of multiple-use natural resources management. The forestry curriculum places additional emphasis on the biological and physical aspects of resource management, while the recreation curriculum places additional 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 a minimum of requirements 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 option or area of emphasis. To graduate in forestry, 199 credits are required.

Freshman year: Biol 125, 126; Chem 111; Engl 101, 200; FR 199, 300; Geol 111; NR 101, 102; Phys 120; Psy 101; and 3 or more credits of General Education or electives.

Sophomore year: NR 201; FR 320, 321; FW 300; Math 215; RR 300; RS 300; Econ 200; Soils 358; WS 300; Stat 201; and 3 or more credits of General Education or electives.

Summer Camp: FR 301, 302, 303; RS 298; Geog/WS 301.

Junior year: Engl 3051; FR 324, 330, 420; Biol 386; NR 360, 370, 380, 390; WS 420; and 3 or more credits of General Education or electives.

Senior year: Bot 563 or Ent 540 or FR 465; FR 443, 445, 510; Geog 534; 24 or more credits of General Education or electives.

Option Courses. Approved departmental options in forestry follow:

Forest Management: minimum of 25 credits including FR 424, 445, 465; Bot 563; Ent 540. Remainder from departmentally approved list.

Forest Watershed: 21 credits including WS 416, 420, 475; CEE 343. Remainder from departmentally approved list.

Forest Recreation: 22 credits including RR 451, 510; FR P 406, 550; FR 553 or MHR 360.

Forest Biology: Bot 420, FR 424, and 15 credits selected from a departmentally approved list.

Natural Resources Policy: 26 credits including Econ 501, 556; PolSci 410, 418, 464; Soc 462, 463; plus one course approved by adviser.
Computer Forestry: 19 credits including CS 171, 172, 241, 525; BA 308; Stat 634.

Urban Forestry: 34 credits in Bot 563; Ent 540; FR 565; PISci 261, 360; PolSci 260; Spch 105; and the remainder from a departmentally approved list.

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. For graduation in recreation resource management, 199 credits are required.

Freshman year: Biol 125, 126; Chem 111; Engl 101, 200; FR 199, 300; Geol 111; NR 101, 102; Physy 120; Psy 101; and RS 300.

Sophomore year: FR 201; Econ 200; FR 320, 321; FW 300; Biol 386; Math 215; Stat 201; RR 300; Soils 358; WS 300; and 3 or more credits of General Education or electives.

Summer Camp: FR 301, 302, 303; RS 298²; and Geog/WS 301.

Junior year: Engl 305¹; FR 324, 330, 420, 534; NR 360, 370, 380, 390; WS 420; and 5 or more credits of General Education or electives.

Senior year: Bot 563 or Ent 540 or FR 465; FR 443, 445, 510; FR 553 or MHR 360; PR P 551; RR 451, 510; 6 or more credits of General Education or electives.

Option courses: Students must complete 6 credits from among MHR 311; Psy 351 or Soc 350; BA 451; Soc 415; Soc 342 or 343 or Psy 321; RR 250; PR P 406, 550, 552.

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; Soc 102; Math 105; Stat 201; Spch 105; Engl 101, 201, 305; Econ 200; NR 101, 102, 201, 360, 380, 390; Biol 126, 127, 386; Chem 111, 141; Soils 358; FR 199, 300, 510; RR 300; RS 300; FW 280, 300; WS 300; CEE 363.

Areas of Emphasis: The area of emphasis or option can be completed in one of the following manners: (1) completing upper division credits for any approved USU minor, or (2) selecting one of three options in environmental management and policy, environmental education, or environmental analysis.

Minors in Forest Resources
Recreation Resource Minor. Required courses include RR 300, 451, 510; and 8 credits from the following list: PR P 406, 551, 552, FR 420, 510, Soc 462, NR 390, Econ 556.

Environmental Studies Minor. Requirements include 24 credits of natural resource courses numbered 300 and above including FR 300; two of the following principles courses: RR 300, WS 300, FW 300, RS 300; plus Biol 386, FR 420, 510, NR 390.

¹Choose three credits from Engl 305, Spch 105, or Comm 130.
²Summer 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.

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, page 52.

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. (2Su)

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. Prerequisites: 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 360, Stat 201 or 301 and Stat 502. (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. (25p)

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. (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. Prerequisites: FR 324, 330; NR 360, 380, 390. (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. (1-3F,W,Sp,Su) ⊗
498. Co-op Education. Directed and evaluated work experience with public and private employers for students in cooperative education programs. (3F,W,Sp,Su)

516. 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. (4F)

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)

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)

536. 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. (2-3W)

563. Forest Pathology. Nature, cause, and control of diseases affecting forest trees. Prerequisite: Bot 560 (may be concurrent). Two lectures, two labs. (4W)

565. Urban Forest Management. Biological, administrative, and social aspects of managing urban forests; field exercises in inventory and planning. (4W)

566. Shade Tree Pathology. Identification, biology, and management of urban tree diseases of regional and national importance. (5W)

Graduate

625. Advanced Silviculture. (3)

628 (d527). Properties and Management of Wildland Soils. (3F)

630. Agroforestry. (3Sp)

641. Current Issues in Multiple-use Forest Management. (3W)

642. Advanced Forest Management. (3Sp)

643. Natural Resource Policy. (3)

653. Natural Resource Administration. (3F)


656. Directed Studies in Forest 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. (1-3) ©

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) ©

1Parenthetical numbers preceded by d indicate a dual listing.
2Descriptions 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.

Recreation Resource Management Courses

10 250. 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)


480. Undergraduate Research. Individual or team research. Prerequisite: adviser approval. (1-3F,W,Sp,Su) ©

491. Directed Study. (1-3) ©

510. Outdoor Recreation Behavior. Examination of the cultural, social, and psychological influences on human behavior in a wildland recreation context and their management implications. Prerequisite: RR 300. (4F)


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. (3W)

Graduate

651. Forest Recreation. (3Sp)

652. Forest Recreation II. (3W)

680. Outdoor Recreation Seminar. (1-3W) ©

691. Directed Study. (1-3F,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) ©

© 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


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 foundation themes of geography—human (cultural), physical, and regional geography—with a 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 will prepare the student to continue on to graduate school or to seek professional employment in the public or private sector.

Besides acquiring fundamental geographic skills and knowledge, the student will have the opportunity to 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 taught. 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/semiarid 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

Major in Geography. Every geography major is required to complete 48 credits in geography courses. A grade of C or better is required in any course in geography 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.

Required introductory courses include Geog 101, 103, 113, 171, and 223. Required methods and techniques courses include Geog 185, 386, and 588. Students will usually include Math 105 and Stat 201 also. In addition, all majors must meet the core curriculum requirements of the College of Natural Resources. 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 advisor 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 (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). (SF,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. (SF,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. (3)

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)


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)

366. Geomorphology. Geomorphic processes, origin of landforms, 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). 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. (1-5)

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)

510. Methods of Ecological and Environmental Mapping. Introduces the concept of mapping in the field from aerial photography and from satellite data to mapping environmental regions and establishing a GIS data base. (3F)

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. (4S)

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. (4S)

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 Systems Planning and Analysis. Attention focused on defining and evaluating alternatives. Transportation system management (TSM) strategies and the role of decision support systems are explored. (3)

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. (1-5)

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 Practice. 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

611 (D511). Environmental Education. (4S)

616 (D416). Hillslope Geomorphology. (4F)

620 (D520). Regional Geography. (3F,W,Sp,Su) ©

624 (D524). Transportation Systems Planning and Analysis. (3)

625. Graduate Cooperative Internship. (1-15)
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, 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.

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) Phys 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, Geoaarchaeology, 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, 415, 430, 470, 530, 540; Chem 121, 122, 123, 124, 160; Phys 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, 521, 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, 564; Math 220, 221, 222, 321, 322; CEE 343 (or CEE 305 and 430); Chem 121, 122, 123, 124, 160; Phys 221, 222, 223; Stat 301; CS 160; Soils 513 (or Soils 358 and 359); Engr 200, 202, 204.

For a BS in Geology (Geoaarchaeology option), the following courses are required: Geol 111, 200, 305, 310, 360, 370, 430, 470; Anth 110, 231, 430, 433, 436, 480 (Human Osteology); 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, 305, 350, 360, 370; Phys 100, 216, 221, 222, 223; Chem 121, 122, 123, 124, 160; NR 511 or Biol/FW 386; FW 260; Bimet 200 or 530; Math 220, 221; Stat 201; Sci 430; SecEd 201, 301, 302, 330, 335, 404, 450, 460, 510; Psy 366; Sp Ed 301; Ins T 445, 447.

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. No more than 3 credits of Geol 350 may be used to fulfill this requirement.

**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.

**Honors.** There is also an Honors option for students seeking a BS in Geology "with Geology Honors." For details, contact James Evans, the Geology Honors adviser.

**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. (FW/Fs/Su)
134 Geology

PS 105. Environmental Geology. Geologic processes and hazards affecting humans. Topics include: earth resources, earthquakes, volcanoes, landslides, floods, waste management, and global changes. Four lectures and one lab per week. (SP)

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. (SF,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. (SP) 

225. Introductory Internship/Co-op. Introductory educational work experience. (1-5F,W,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. (SP)

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. (SP)

350. Geology Field Excursions. Geologic features and processes observed in the field. Prerequisites: Geol 101 or 105 or 111 and permission of Instructor. (1-3SP,SP,SP)

360. Geomorphology. Orogenic 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. (SP)

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, Phys 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. Prerequisite: Geol 305; Phys 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. (SP)

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. (1-3F,W,SP,SP)

**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. (SP)

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. (SP)

490. Special Problems. Directed study of selected topics. Written report required. (1-5F,W,SP)

**516 (d516).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. (SP)

*520. Geology Field Camp. Integrative field activities to provide in-depth skills and knowledge of the methods of field geology. Prerequisites: Geol 305, 310, 370, 470; Geol 410, 416, 430 recommended; or permission of instructor. (SP)

*531 (d531). 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. Four lectures per week. Prerequisite: Geol 370. (SP)

**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. (SP)

**536 (d636). Palaeoecology.** 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. (SP)

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. (SP)

**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 Phys 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 448; or (2) Geol 111 and CEE 543; or (3) permission of instructor. (SP)

**552. Metallic Mineral Deposits.** Origin and geologic occurrence of metallic mineral deposits. Three lectures and one lab per week. Prerequisites: Geol 370, 410, 416. (SP)

**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. Glacial Geology.** Introduction to glaciology, glacial erosion and deposition, isotopic 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. (4W)

**564. Photogeology.** Interpretation of geologic features on aerial photographs. One lecture and two labs per week. Prerequisites: Geol 360 and 370. (SP)

**568. 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. (SP)

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)

Graduate2

**614. Interpretation of Sedimentary Rocks.** (SP)

**616 (d516).** Igneous and Metamorphic Petrography. (SP)

**624. Advanced Structural Geology.** (4F)

**631 (d531).** Global Geophysics. (SP)

**632 (d532).** Tectonics of Orogenic Belts. (SP)

**636 (d536).** Paleoecology. (SP)

**640. Topics in Hydrogeology (Topic).** (SP)

649 (d649). Hydrogeologic Field Methods. (SP)
Department of

Health, Physical Education and Recreation

College of Education

Head: Professor Robert E. Sorenson
Office in PE 122, 797-1497

Professors Richard D. Gordin, Jr., Lanny J. Nalder; Associate Professors Donna L. Gordon, Arthur R. Jones, Deana Lorentzen, Dennis A. Nelson; Assistant Professors Hilda Fronske, Steven R. Hawks, Julianne Abendroth-Smith, Bradford N. Strand, Rolayne Wilson; Instructors Susan C. Hill, Lynn Walter Topovski; Lecturers Raymond Corn, Peter J. Mathesius, Maggie E. Moar; Adviser Mary Lou Reynolds

Degrees offered: Bachelor of Science (BS) in Health Education; 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.

Requirements

Departmental Admission Requirements. Admission requirements for the Department of Health, Physical Education and Recreation are the same as those described for the University on pages 8-11. Students in good standing who wish to major in health, physical education, recreation, or dance may apply for admission to the department.

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.

Physical Education Major: Teaching Option

The teaching option in physical education offers a program of study leading to a Bachelor of Science degree. 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 PE P 200, 201, 206, 301, 302, 322, 326, 360, 364, 365, 458, 469, 480, 481, 483, 486, 487, 488; HE P 429; PE 300, 462; one method of coaching class; and 11 credits of skill development.

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 80 credits. The required core includes PE P 200, 322, 326, 425, 458, 481, 483, 487, 488; PE 300, 463; HE P 250, 545; and NFS 122. The student must also select at least 44 additional credits from advisor approved electives, including a maximum of six activity classes. All students must complete a
three-credit internship in cooperative education as part of the elective requirement.

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 95 credits. The required core includes PE P 202, 322, 326, 425, 458, 481, 483, 487, 488; PE 300, 463; HE P 250, 545; and NFS 122. The student must also select 55 elective credits from the following areas: Mathematics, Chemistry, Physics, Biology, Psychology, and First Aid. 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 37-credit minor include PE P 322, 360, 364, 365, 458, 469, 480, 481, 483, 486, two methods of coaching classes, and a minimum of four credits in skill development.

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 24-credit minor include PE P 302, 360, 488; HE P 429, 441; and DE P 462. Students must also select 7 or more credits from the following: PE 115, 300; DE 176, 178; PE P 226, 230, 231; and PR P 200.

Health Education Specialist Major: School Health Option (Teacher Certification)

The school health education option offers a program of study leading to a Bachelor of Science degree in Health Education. With this teaching major of 45 credit hours, it is necessary for a student to also complete an approved teaching minor, ranging from 24 to 28 credit hours, plus 14 credit hours of professional education classes. The school health education curriculum consists of the following 32-credit required core: Physl 103, 130; NFS 122; and HE P 250, 401, 429, 441, 456, 457, 458. An additional 13 credits must be selected from the following: HE P 431, 440, 451, 482, 545, 590; Pub H 302, 512, 530; Biol 308; SW 365, 375; Soc 333; and HE P 555, 556. (HE P 459 will count toward the professional education component.) 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.

Health Education Specialist Major: Community Health Option

The community health education option offers a program of study leading to a Bachelor of Science degree in Health Education. This option requires completion of the following required core: Physl 103, 130; NFS 122; HE P 250, 401, 429, 440, 441, 451, 456, 457, 458, 459, 482, 545, 590; Pub H 512, 530. Students must select 32 credits of elective courses, taking at least one course from each of the following three areas: Human Nature: Anthr 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; HE P 431, 440, 555, 556; NFS 222, 448; PE P 481, 491; Psy 372, 520; Soc 446, 475; Spch 105; Organizational Dynamics in the Family and Community: Comm 452; FHD 301, 304; PolSc 205; Pub H 302; Soc 452, 472; Spch 260 or 325; Pub H 349.

Health Education Specialist Minor

For a community health education minor, students must complete the following courses, totaling 29 credits: Physl 130; NFS 122; HE P 250, 401, 429, 441, 456, 457, 458, and 459.

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.

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.

Recreational Dance Minor

This minor option prepares the student to teach recreational dance forms such as folk dance, ballroom dance, square dance, etc. in formal and informal social settings. A minimum of 29 credits is required.

Prerequisite: HE P 401.

Prerequisite: HE P 451.
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.

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 60 credits. The following courses are required: PR P 100, 200, 403, 404, 406, 410, 450, 480, 501, 505, 550, 551, 552, 560. In addition the student must choose 12 credits from the following courses: PR P 405, 409, 500, 505, 552; RR 250, 300, 451.

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 PR P 100, 200, 403, 404, 406, 552. Students must also select 6 additional credits from the following courses: PR P 409, 500, 505, 552; 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) ©

400. 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: HE P 250 or consent of instructor. (3F, W)

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)

429. First Aid and Emergency Care. American Red Cross course provides 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)

430. Cardiopulmonary Resuscitation. Techniques and skills of airway management and cardiopulmonary resuscitation for the layperson, taught according to 1986 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: HE P 429. (3Sp)

440 (d640). 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. (3W, Sp)

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, Sp, 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: HE P 401 or consent of instructor. (3W)

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. (3F, Sp)

457. Consumer Health. Focuses on helping students to become discriminating consumers of health information, health products, and health services. (3F, W)

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. (3W, Sp)

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)

482. Field Work in Health Education. Supervised student participation in school or community health programs or directed projects. Prerequisites: HE P 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. (1-5F, W, Sp, Su)

510 (d610). 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. (3W)

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, Sp)

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. (1-6F, W, Sp, Su) ©

591. Independent Research. (1-6F, W, Sp, Su) ©

Graduate²

610 (d610). Current Trends in Health Education. (3W)

625. Graduate Cooperative Work Experience. (1-15)

640 (d640). Stress Management. (3W, Sp)

645 (d645). Health Aspects of Aging. (3W, Sp)

655. Practicum in the Evaluation of Instruction. (1-6) ©

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

682. Seminar in Health Education. (1-5) ©

690. Independent Study. (1-3) ©

691. Independent Research. (1-3) ©

697. Thesis. (1-9) ©

699. Continuing Graduate Advisement. (1-12) ©

¹Parenthetical numbers preceded by a d indicate a dual listing.

²Descriptions for courses in the 600 and 700 series can be found in the graduate catalog.
138 Health, Physical Education and Recreation

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,W,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: PE P 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: PE P 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. PE P 204 deals with football. PE P 205 deals with basketball, volleyball, and softball. (2F,Sp)

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)

211. Fundamentals of Weight Training. Provides physical education majors/minors with knowledge, skills, and understanding of weight training to allow successful participation in the sport as well as teaching competency. (1W)

212. Fundamentals of Tennis. Provides physical education majors/minors with knowledge, skills, and understanding of tennis for successful participation in tennis as well as teaching competency. (1Sp)

213. Fundamentals of Badminton. Provides physical education majors/minors with knowledge, skills, and understanding of badminton for successful participation in badminton as well as teaching competency. (1W)

215. Introductory Cooperative Work Experience. As introductory level educational work experience in a cooperative position approved by the department. Credit arranged. (1-6F,Sp,Su,3F)

216. Fundamentals of Volleyball. Provides physical education majors/minors with knowledge, skills, and understanding for successful participation in volleyball as well as teaching competency. (1F)

217. Fundamentals of Soccer. Provides physical education majors/minors with knowledge, skills, and understanding of soccer for successful participation in soccer as well as teaching competency. (1Sp)

218. Fundamentals of Basketball. Provides physical education majors/minors with knowledge, skills, and understanding of basketball for successful participation in basketball as well as teaching competency. (1W)

219. Fundamentals of Track and Field. Provides physical education majors/minors with knowledge, skills, and understanding of track and field for successful participation in the sport as well as teaching competency. (1Sp)

220. Fundamentals of Track and Field. Provides physical education majors/minors with knowledge, skills, and understanding of track and field for successful participation in the sport as well as teaching competency. (1W)

221. Fundamentals of Weight Training. Provides physical education majors/minors with knowledge, skills, and understanding of weight training to allow successful participation in the sport as well as teaching competency. (1W)

222. Fundamentals of Badminton. Provides physical education majors/minors with knowledge, skills, and understanding of badminton for successful participation in badminton as well as teaching competency. (1W)

223. Fundamentals of Softball and Football. Provides physical education majors/minors with knowledge, skills, and understanding of softball and football to allow successful participation as well as teaching competency. (1P)

224.实施细则 Cooperative Work Experience. An introductory level educational work experience in a cooperative position approved by the department. Credit arranged. (1-6F,Sp,Su,3F)

225. 474. Advanced 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)

226. 475. Advanced 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)

230. 476. Advanced 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)

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,Sp,3W,3F)

320. 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. (3F,Sp)

326. Anatomical Kinesiology. An understanding of human anatomy and basic mechanical principles which is fundamental to the application of efficient human movement. Prerequisite: Phys 103. (3F,Sp)


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,Sp)

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. (1-1SF,W,Sp,3F)

458. 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. (3F,Sp,3W)


466. Methods of Teaching and Coaching Gymnastics. Prepares students as future teachers and coaches of men's and women's gymnastics. How to organize classes or teams in proper training conditions while maintaining a safe environment. (2Sp)

469. Field Based Practicum in Physical Education. Designed to provide the physical education major with practical field-based experiences via micro-teaching opportunities in cooperating schools. Prerequisite: PE P 460. (2F,3W,3F,Sp)


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. (3W)

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: Phys 130. (3W,Sp,3Sp)

483. Biomechanics. Focuses on improved teaching and coaching through biomechanical and anatomical analysis of sports and related activities. Prerequisite: PE P 326. (3W,Sp)

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)
488. Adapted Physical Education. Designed to help prospective teachers recognize student physical impairments and handicaps, their etiology, prevention, and rehabilitation. (3W, Su)

497I. 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. (1-5F, W, Sp, Su)

500 (d600). 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. (3P)

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)


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

600 (d580). Administration of Athletics. (3Sp)

601 (d591). Leadership in Health, Physical Education and Recreation. (3Sp)

602. Seminar in Risk Reduction. (1W)

*605 (d595). Psychological Aspects of Sports Performance. (3Sp, Alt Su)

607 (d597). 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)

650. Interdisciplinary Workshop. (1-3)

654. Exercise Prescription Writing. (3Sp)


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)


699. Continuing Graduate Advisement. (1-12F, W, Sp, Su)  

*Taught 1994-95.

**Taught 1995-96.

¹Parenthetical numbers preceded by a d indicate a dual listing.

²Descriptions for courses in the 600 and 700 series can be found in the graduate catalog.

Ω 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)

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, W, 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. (3F)

404. Community Recreation. Preparation in community organization of recreation; role of agency operation centering on budgetary procedures and grantsmanship; role of interagency relationships. (3W)

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; 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: FR P 100, 200, 403, 404, 406, and 409 or 505. (1-15F, 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: FR P 410. (1-15F, W, Sp, Su)

450 (d660). 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. (3F)
49TH. 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. (3Sp)

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: PR P 450. (3W)

525 (d650). Advanced Therapeutic Recreation. Highlights the advanced protocol procedures of disability identification, program development, treatment planning, progress note writing, and protocol evaluation. Prerequisite: PR P 505. (3Sp)

550. Recreation Areas and Facilities. A study of the basic planning procedures, techniques, and methods of parks, community recreation, and school physical education facilities. (3F)

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: PR P 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)

560. Park Management. Park maintenance management, including planning and organizing, personnel, buildings, structures, general outdoor, grounds, equipment, and public impact. (3Sp)

590. Independent Study. (1-3) ®

591. Independent Research. (1-3F,W,Sp,Su) ®

Graduate

600 (d450). Recreation for Diverse Populations. (3F)

601 (d501). Leadership in Health, Physical Education and Recreation. (3Sp)

605 (d505). Therapeutic Recreation. (3W)

625. Graduate Cooperative Work Experience. (1-15F,W,Sp,Su) ®

650 (d525). Advanced Therapeutic Recreation. (3Sp)

652 (d522). Recreation Administration. (3Sp)

680 (d480). Seminar in Recreation. (3Sp)

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) ®

Activity Courses in Physical Education

104. Track and Field. Varsity. (1Sp) ®

106. Indoor Track and Field. Varsity. (1Sp) ®

107. Cross Country. Varsity. (1F) ®


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) ®


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. Prerequisite: DE 176. (1F)

250. Forum Studio Performance—Performers. Practicum course in modern dance designed to provide students with experience in performing and producing a studio performance. (1-25p)

290. Fundamentals of International Folk Dance. A course designed to develop teaching techniques in folk dance. 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 with at least one year of experience in modern dance. (1F, W, Sp)

292. Modern Dance II. Concentrates on modern dance technique for the intermediate level student. For majors or nonmajors with at least two years of experience in modern dance. Prerequisite: permission of instructor. (2F, W, Sp)

300. 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: DE P 292. (2F)

311. Dance Composition. Focus will be on movement "studies" to practice the skills used in creating, abstracting, and manipulating movement. Prerequisites: DE P 309 and permission of instructor. (3F)

312. Choreography. Continuation of work done in DE P 311, focusing on the development of material, theme, and performance style. Prerequisite: DE P 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 classes. DE P 315 is a prerequisite for DE P 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 who have had at least three years of experience in modern dance. 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)

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 teach dance skills using a variety of approaches. Prerequisites: DE P 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 must class. 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)


556. Practicum in Improving School Program Systems. 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)

173. Square Dance. Designed for beginners and novices. Includes an introduction to all basic square dance patterns. (1W, Sp)

174. Elementary Precision Rhythms. Aggiettes. (1)

176. International Folk/Clogging. Designed to develop basic fundamental folk dancing skills and rhythms and to acquaint the students with a brief history of folk dance. Will include an introduction to beginning clogging skills. (1F)

178. Ballroom Dance. Designed for beginners and novices. Includes introduction to all basic ballroom dance steps. (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)

383. Advanced Ballet. Designed to provide an advanced-level technique class of an hour-and-a-half for the more advanced dancer. Barre and center exercises are longer and more complex than in the intermediate ballet class. Classical variations and Pas de Deux will be taught when applicable. (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 188W. 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. (1Sa)

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
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 of 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)

DE F 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 Life Span Learning Independent Study Division.

*Taught 1994-95.

**Taught 1995-96.
Department of History

College of Humanities, Arts and Social Sciences

Head: To be appointed
Office in Main 323, 797-1290, TTD 797-1297


Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA), Master of Science (MS), and Master of Arts (MA) in History; Master of Social Science (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 90 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 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, 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.

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 Science. 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 mankind. 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 century. (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. (SF,W,Sp)

SS 105. Western Civilization: Modern. A survey of European civilization from the Reformation to the present day. (SF,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. (3)

SS 170. American Civilization. The fundamentals of American history. Successful completion of this course meets the American institutions requirement established by the state legislature. (SF,W,Sp) ©

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

308. 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)


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)

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 present day. (3)

337. Ancient and Medieval England to 1683. From Julius Caesar to the death of Elizabeth I: a history of England’s political, social, economic, and cultural origins. (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—1608-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 Frederick 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, ethnicity, 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

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 (0072). Folklore Colloquium. Issues, problems, and methodologies in folklore study. (3) Ø

General Education
10 395. 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)
10 401. The Civilization of Human Societies. An integrated thematic approach to the investigation of social, political, religious, economic, technological, and aesthetic forces that have propelled human societies towards civilization. (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) Ø
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)
433. 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)
434. 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 abolitionist, and other reform groups. (3)
435. 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) Ø
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)
445. 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)
446. 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)
458. 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)

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
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) Ø
491. Readings and Conference. (1-3F,W,Sp) Ø
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) ©

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 prerequisites 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 (d546). Folk Groups and Folklore Genres. Survey of folk groups and folklore genres. Taught during Fife Folklore Conference only. (See English 546.) (3Su) ©

579 (d579). 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)

585. Special Topics in British History. (3)

Senior Professional Course

596 (d644). American West: Its Literature and History. (See English 596.) (2-3) ©

Graduate²

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. (d590). 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 Folklore. (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. (1-12)

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) ©

¹Parenthetical numbers preceded by d indicate a dual listing; parenthetical numbers preceded by an f are the former course numbers.
²Descriptions 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 Life Span Learning Independent Study Division.
Department of

Human Environments:
Apparel Merchandising, Interior Design, Consumer Sciences, and Home Economics Education

College of Family Life

Head: Professor Joan R. McFadden
Office in Family Life 303, 797-1558

Professor Jean M. Lown; Professor Emeritus Alison C. Thorne; Associate Professors Leona K. Hawks, Jane L. McCullough, Marilyn B. Noyes, Tom C. Peterson, Janet E. Preston; Associate Professor Emeritus LaRae B. Chatelain; Assistant Professors Luella F. Anderson, Jeanette J. Arbuthnot, Ann C. Deegan, Elizabeth E. Gorham, Elizabeth Rogers, JoAnn Wilson; 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 Home Economics Education; BS and BA in Apparel Merchandising; BS and BA in Interior Design; Master of Science (MS) in Human Environments

Area of specialization: Vocational Home Economics Education

Objectives

The Department of Human Environments offers three majors—apparel merchandising, home economics education, and interior design.

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 14-16 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 suggested sequence for completing required coursework for the Apparel Merchandising Major is as follows:

Freshman Year: Engl 101 or 111; H Env 103 (1 credit required), 105, 111, 112 (1 credit of 2 required); Phil 111; Psy 101 or Soc 101; Math 105; BIS 140; 5 credits of Physical Science; 5 credits of Life Science; 3 credits Family Life Core; 3-5 elective credits.* (45-47 total credits)

Sophomore Year: Engl 200 or 201; Acctg 201; H Env 112, 215, 224, 266; Econ 201; 3 credits Family Life Core; 3 credits Life Science; 3 credits Life or Physical Science; 3 credits Integrative Option; 5 credits American Institutions; select skills course; 5-6 elective credits.* (45-47 total credits)

Junior Year: H Env 335, 336, 374, 386, 396; MHR 311, 364; BA 350; Spch 105; Stat 230 or Psy 380; 5-7 elective credits.* (45-47 total credits)

Senior Year: H Env 406, 425 (6 credits required), 467, 469; BA 451, 454, 455; 13-19 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 (H Env 212). Students are encouraged to take advantage of this opportunity, however, it is not required.

*Prerequisites needed for Business Administration courses are strongly recommended.

Home Economics Education Major

This major provides professional preparation for teaching Consumer and Home Economics 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.

The suggested sequence for completing required coursework for the Home Economics Education Major is as follows:

Freshman Year: H Env 105, 125, 201, 210; FL 110; FHD 120, 150; NFS 122; BIS 140; Engl 101 or 111; Math 101; Psy 101; Physl 130.
Sophomore Year: H Env 103, 202, 203, 215, 224, 265, 304; NFS 222, 225; Chem 111, 141; Engl 200 or 201; 5 credits of American Institutions requirement; 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: H Env 255, 300, 320, 349, 351, 355, 440, 445; FHD 304; NFS 407, 408; Engl 301 or 305, or SecEd 306; Psy 366; SecEd 301, 404; 3 credits of integrative option or science.

Senior Year: H Env 450, 460; FHD 455, 475; Ins T 445, 447; Sp Ed 301; SecEd 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: H Env 101 (2 credits), 105, 125, 131, 135; FL 110; Art 102, 120; 11 credits of Learning Skills (to include BIS 140); 5 credits of Americanization; 5 credits of Physical Science.

Sophomore Year: H Env 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 Science; 5 credits of Life Science; and one Art elective.

Junior Year: H Env 101 (1 credit), 301, 309, 310, 311, 313, 321, 331, 332, 333, 371, 372; MHR 299; two Art electives; H Env 425 should be taken after the junior year.

Senior Year: H Env 101 (2 credits), 374, 401, 422, 434, 465, 471, 472, 473, 3 credits of H Env electives (255, 349 or 355); 6 credits of Art electives (skills courses); English 301 or 305; 3 credits of FHD (SS) electives (120, 150, or 304); 3 credits of Life Science or Physical Science; 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: H Env 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: H Env 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.

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

Graduate study in the Department of Human Environments encompasses programs in each of three major areas of emphasis: apparel merchandising, consumer sciences, and home economics education.

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 care of sewing machines. Challenge Exam option available. No previous experience necessary. (3Sp)


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. (3F)

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)

201. Concepts of Home Economics Education. Introduction to concepts needed in preparation for teaching secondary home economics. The course will also include an overview of current trends in home economics. (3F,W)
202. Field Based Experiences for Preservice Teachers in Secondary Schools. Experience in a public school home economics department as a teacher's intern. Student must set up contract with college supervisor prior to experience. (3F)

203. Home Economics Professional Development Seminar. Seminars providing an orientation to the professional aspects of home economics. Exploration of related careers, exposure to practicing professional home economists, current research reports, field trips, and career development. (1W,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) ⊗


224. Basic Textiles. A study of fibers, yarns, fabric construction, and finishes as related to the appraisal, 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,6u)

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. Prerequisite: H Env 131. (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. Prerequisite: H Env 232. (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: H Env 233. (3Sp)

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)

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 105, BUS 140, Accnt 201. (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: H Env 131 and 135. (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. (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: H Env 125, 131, and 234. (3Sp)


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: H Env 254. (3W)

303. Evaluation of Equipment for Sewing Laboratories. 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: H Env 105, 210, or equivalent. (3F)

309. History of Interior Furnishings I: Ancient-Napoleonic. 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)


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. (3Sp)

313. Interior Materials. Identification of current interior materials; their characteristics, use, and care. Experience in specifications estimation, workshop 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: H Env 210, 304, or equivalent courses. (3W)

331. 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: H Env 331. (3W)

333. Design Studio Fundamentals. Analysis of various approaches used in problem solving. Graphical and verbal presentation of solutions with emphasis on evaluation. Three two-hour studios per week. Prerequisites: H Env 234, 291. (3F)

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: H Env 349. (4Sp)

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)

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)


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: H Env 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: H Env 224. (3W)

396. Visual Merchandising and Promotion. Visual merchandising and special events production. Prerequisite: H Env 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: H Env 301. (3F)

406 (d406). 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: H Env 103, 210, 304, or equivalent. (3Sp)

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: H Env 333. (3F)

440. Teacher-learning Strategies in Home Economics. Development of competency in curriculum planning, and skill and sensitivity in the use of various teaching-learning strategies and resources. Prerequisites: H Env 201, SecEd 301, Psy 366 (or take concurrently). (3Sp)

445. Occupational Home Economics. Methods of successfully planning and maintaining home economics occupational programs in secondary schools. (3W)

450. Curriculum Seminar. Take with H Env 460. Register with the instructor of H Env 440 one quarter prior to student teaching. (3F,W)

460. Student Teaching in Secondary Schools. Prerequisite: H Env 440. (12F,W)

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 (d467). Apparel Marketing Strategies. Application of effective apparel merchandising practices for small and large retail businesses. Prerequisites: H Env 386, 396, BA 350, or consent of instructor. (3F)

469 (d469). 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. Prerequisites: H Env 332, 333, 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: H Env 471. (3Sp)

473. Senior Review and Exhibition. Review and exhibition of completed projects. (2Sp)

490. Independent Study. Students must identify a project with the instructor before registering. (1-12F,W,Sp,Su) ©

520. Workshop (Topic). (1-3) ©

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 Home Economics. (3)

615. Home Economics Classroom Management and Discipline. (3) 1

617. Curriculum Development. (3)

618. Curriculum Testing and Evaluation. (3)

620. International Apparel and Textile Trade. (3)

622. Teaching Techniques for Human Sexuality. (3)

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 Home Economics Education. (3-6)

645. Adult Education in Home Economics. (3)

649. History and Philosophy of Home Management. (3F)

652. Consumer Studies Resources. (3F)

655. Consumer Credit. (3Sp)

656. Family Financial Problems. (3F)

662. Using and Interpreting SPSSX to Analyze Social Research Data. (3F,Sp,Su)

665. Current Developments in Housing. (3)

666. Clothing and Merchandising Problems. (3) 1

667 (d467). Apparel Marketing Strategies. (3F)

669 (d469). Current Issues in Apparel Merchandising. (3Sp)

670. Home Economics Colloquium. (1-3)

671. Seminar. (1-3) ©

674. Advanced Textile Problems. (3W)

675. Current Issues in Research. (3F)

680. Research Methods in Home Economics and Consumer Education. (3)

690. Independent Study. (1-5F,W,Sp,Su) ©


699. Continuing Graduate Advisement. (1-3F,W,Sp,Su) ©

700. Leadership in Vocational Education. (3) 1

733. Supervision Practicum. (3-12) 1

781. Research Seminar. (1-6) 1

797. Dissertation Research. (1-18) ©

1Offered as needed.

2Parenthetical numbers preceded by d indicate a dual listing.

3Descriptions 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 1994-95.
Department of
Industrial Technology and Education

College of Engineering

Head: Professor Maurice G. Thomas
Office in Industrial Science 112E, 797-1795

Associate Professors Ward P. Belliston, Jay C. Hicken, Reed M. Nielsen, Jr., Edward M. Reeve, David P. Widauf; Assistant Professors Barbara A. Snoden, Gary A. Stewardson, Charles E. Tinney; Lecturers Jerry L. Goodwin, Charles B. Larsen, Roger A. Mann

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 Aeronautics Technology, Airway Science, Electronics Technology, Flight Technology, and Welding Engineering Technology; Master of Science (MS) in Industrial Technology

Associate of Applied Science (AAS) Degrees: Aviation Maintenance (A & F) 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. Aeronautics Technology graduates fill aviation maintenance management positions in government and industry. Airway Science is a Federal Aviation Administration certified program to train individuals for careers in the FAA. Electronics 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/project 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 all Engineering Technology and Flight 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 for application 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. Students on probation may not preregister. The student's major code will be changed to a preprofessional code. The student must meet at least quarterly with the 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, 325, 372, 373, 443, 450, 460, 504, 521, 522, 524, 550, 580; Math 105, 106; Chem 101; Engl 101, 201, 305; Inst T 445, 447; Phys 101; Psy 101, 366; SecEd 301, 302, 404, 510; and Sp Ed 301. Students in this degree also take ITE depth courses (minimum of 15 credits), 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: technical and trade courses, 43 credits; professional courses, 40 credits; general education, 49 credits; technical education, 19 credits; and general electives, 35 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

Engineering Technology Specialization. Graduates in Engineering Technology are prepared to enter industry in a variety of technical/management positions including aviation, manufacturing, production, and design. The basic curriculum includes courses in computer aided drafting and design, electronics, controls, machining operations, materials and processes, automation/robotics, NDT, composites, management, quality control, computer science, and safety. In addition, students select a concentration in either aerospace, welding, or electronics.

The courses for the Engineering Technology specialization are as follows: ITE 100, 103, 120, 121, 133, 144, 164, 185, 230, 231, 237, 352, 367, 382, 385, 420, 430, 458, 464, 482, 568, 574; Spch 105; BIS 140; Math 105, 106, 215, 216; Engl 101, 201, 305; Phys 111, 112; BA 308, 370; Chem 111; Stat 230, 508; CS 170; MHR 311, 360; Econ 200.

Students in the Aerospace emphasis must also take 14 or more credits from ITE 113, 114, 117, 210, 217, 333, and 419. Students in the Welding emphasis must also take 14 or more credits from ITE 165, 267, 363, 575, and 576. Students in the Electronics emphasis must also take 14 or more credits from ITE 140, 205, 240, 260, 337, 338, 341, and 437.

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; Phys 111, 112; Bimet 200, 325; MHR 299, 311, 360.

In addition, students in Flight Technology must complete a minor in Management. To do this, they must choose four classes from the following list: MHR 364, 414, 415, 461; Econ 520, 521. A GPA of 2.5 or higher must be earned in the classes used for the Management 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.

Associate of Applied Science Vocational-technical Programs

The two-year curricula develop strong vocational skills in one of two areas of specialization—aviation/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 103, 113, 114, 117, 118, 120, 124, 125, 144, 164, 210, 211, 212, 213, 214, 215, 217, 218, 219, 220, 230, 231, 242, 243, and 244; Math 105. General Education credits (26) are required for the AAS degree as described on pages 21-25. 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; CS 150; 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,5Sp)

104. Construction Technology Education. Exploration of the materials, processes, and management of the construction industry. (3W)

108. Electronic Instrumentation. Study of electronic circuit fabrication and the basic theory of operation of power supplies, analog and digital multimeters, function generators, oscilloscopes, and transistor curve tracer. (1)

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. (5F)

118. Aircraft Structures Laboratory. Laboratory applications and practical experience with subjects covered in ITE 117. (4F)

120. Drafting. Lettering, print reading, geometric construction, sketching, multiview drawings, pictorials, dimensioning theory and practice, sectional views, and auxiliary views. (3F,5W)


122. Drafting Practicum. Provides drawing experience. (1-2F,5W,5Sp)


125. Aircraft Maintenance Laboratory. Application of maintenance procedures studied in ITE 124. Prerequisites: ITE 113, 114. (4Sp)

133. Digital Logic. Study of number systems, base two, octal, hexadecimal, logic gates, flip-flops, counters, and Boolean algebra concepts, combinatorial and sequential logic. (3F)

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)

151. Machining Operations. Function, setup, and operation of machine tools. Emphasis on precision measurement and layout, cutting tool theory and grinding, drilling, tapping, turning, boring, milling, and surface grinding. (3)

164. Basic Welding. Theory, operating principles, equipment, and industrial application of SMAW, OAW, and OFC. Laboratory practice with SMAW, OAW, OFC, and brazeing. (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. (2F,5W)

171. Technical Woods. Operation of basic machine woodworking equipment with study of their uses and nomenclature. (3W)

185. Industrial Materials. Structure, characteristics, and testing methods used to identify properties and select materials for industrial applications. Includes metals, plastics, elastomers, ceramics, and composites. (3W)

186. Industrial Processes. Theory, operation, and application of manufacturing processes. Includes production design and selection, metal casting, machine tools, forging, powder metallurgy, finishing, and plastic forming processes. (3)

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. (3W)


211. Aircraft Powerplant Laboratory. Application of principles and components studied in ITE 210. (4F)

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 systems. 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. (1-2F,5W,5Sp)

230. Electronics. Systems, components, circuits, measurements, laws, and construction practices related to DC electricity. Prerequisite: Math 105. (3P)

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 230. (3W)

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, W)

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 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)


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. Prerequisites: 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. (3W)

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)

260. Communications Circuits. Study of AM and FM transceivers. Prerequisite: ITE 240. (3W)

262. Commercial Pilot Ground School. Commercial flight operations including performance, cross country planning, advanced systems operation, 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 and SMA Welding. Development of skills to meet ASME qualification requirements for GTA, GMAW, and FCA. Prerequisite: ITE 164. (3W)

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. Prerequisite: ITE 264. (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)


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. (3F, W, Sp, Su)

302. National Airspace Systems and Control. Study of the national air traffic control system, airspace usage, and facilities. (3Sp)

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. (3F)

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)

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)

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. (3W)

314. Advanced Avionics Systems. In-depth study of the state of the art flight deck instrumentation systems (i.e. GIPS, RNAV, EFIS, and HS1). (3W)


320. Descriptive Geometry. View relationships, spatial visualization, and problems relating to points, lines, and planes. Prerequisite: ITE 120. (3W)

322. Architectural and Construction Systems. Principles of residential and commercial design, construction system, and working drawings. Prerequisites: ITE 120, 121, 123.

323. Machine Drafting. Techniques, symbols, conventions used in representation of gears, cams, jigs, and fixtures. Prerequisites: ITE 121 and Math 106. (3Sp)

324. Technical Illustration. Methods of converting orthographic drawings into three-dimensional drawings. Shading, inking, and airbrush techniques are introduced. Prerequisite: ITE 121. (3Sp)

325. Production Drafting. 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. (3)
333. Applied Technology Laboratory. Design and manufacture of composite/metallic structures, prototype construction, to include materials selection, process definition, tooling development, and structural fabrication applying proven engineering methods. Prerequisites: ITE 117, 210. (3Sp)


338. Microprocessors II. Assembly language programming, busing, timing, I/O, PIA, printer subroutines, and logical operations in solving real world and community problems. Prerequisite: ITE 237. (3F)

339. Industrial Electronics. Concepts of electron devices and circuits used in industrial applications for measurement and control purposes. Prerequisite: ITE 140. (3)

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 260. (3Sp)

351. Machine Tool Technology. Complex set up and machining processes. Taper cutting, gear theory, indexing, cutter grinding, profile milling, and shaping. Prerequisite: ITE 151 or equivalent. (3)

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)

361. Programmable Manufacturing Automation. Principles, operation, and application of computer controlled industrial machines. Introduction to computer managed systems including CAD/CAM, CIM, DNC, artificial intelligence, and expert systems. (3)


365. Industrial Brazing and Soldering. Fundamentals of brazing and soldering processes, joint designs, metallurgy, and applications of brazing. (3)

367. Fundamentals of Joint Design. Fundamentals of design of bolted/riveted joints, adhesively bonded joints, and welded joints. The modes of failure of these joints will be discussed. Prerequisite: ITE 385. (3W)

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)


385. Mechanics and Properties of Materials. Introduction to the basics of strength of materials with applications to metals and composites and explanations of their properties in terms of material structure. Prerequisites: ITE 185, Math 215, Phys 112, Chem 111. (3F)

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 (6619). Fundamentals of Aerospace Structures Design. Study of the loads on aerospace structures such as wings, tail surfaces, and landing gear. Simplified analysis of loads and the resulting stresses and strains will be accomplished using the classical approach and BASIC computer programs. (3Sp)

420 (6620). 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. (1-4F,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. (3F)

428. Airline Operations. In-depth study of airline operations and their organizational structure. (3Sp)

430 (6630). Corrosion and Corrosion Control. Analysis of the mechanisms of corrosion of ferrous metals, nonferrous metals, and nonmetallic materials and the control of corrosion. Prerequisite: ITE 385. (3Sp)

436. Data Communications Technology. Essentials of computer communications with emphasis on types of links: analog, digital, and protocol testing and interfacing computers to networks. (3)

437. Microprocessors III. Operating system, application, interfacing, and troubleshooting of microcomputers. Prerequisite: ITE 338. (3W)

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 SecEd 301. (4F)

448. CFI Practicum. Actual experience teaching private pilot ground school or teaching simulator procedures to USU students. Supervised and graded by University instructors. (3F,W)

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. (3Sp)

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 SecEd 450). (3W)

456 (6650). Industrial Robots. Principles, operation, and application of robots to material handling, assembly, and joining processes. Includes hardware and software applications for industrial technology. Prerequisites: ITE 352 and Math 216. (3)

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 SecEd 460). (12W)
464 (664). 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: ITE 352. (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 (682). 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. (3P)

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. (3P)

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, SecEd 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)

559. Technology and Society. A study of the dynamic interaction between technology and society and responsibility of humans in directing changes of our future. (3P)

568. Applied Engineering Technology Research. Development and completion of an approved applied aerospace research project. Prerequisite: ITE 385. Limited to senior students. (2F, W, Sp)  

574. Principles of Material Science. Fundamentals of material science such as bonding, structure, defects, and properties of metals, ceramics, and plastics are discussed. Testing of materials also studied. Prerequisites: ITE 385, Math 216. (4F)

575. Welding Metallurgy. Metallurgy principles are applied to welding and testing of steels, stainless steel, 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  

649. Curriculum for Technology Education. (3Sp, Su)

650. Issues and Trends in Technical Education. (1-5Su)  

654. Fundamentals of Aerospace Structures Design. (3W)

662. Composite Manufacturing Processes. (4W)

665. Internship. (1-12F, W, Sp, Su)  

666. Welding and Corrosion Control. (3P)

670. Cooperative Industrial Programs. (3S)

643. Organization of Industrial Education Programs. (3W, Su)

644. Administration and Supervision of Technology Education. (3Sp, Su)

652. Industrial Robots. (3W)

661. Strategies of Instruction. (3F, Su)

663. Welding in Extreme Environments. (3Sp)

664. Tooling for Automation. (3Sp)

675. Research in Technology Education. (3F, Su)


682. 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)  


699. Continuing Graduate Advisement. (1-3F, W, Sp, Su)  

723. Foundations of Vocational Education. (3Su)

746. Vocational Education Finance. (3Su)

781. Research Seminar. (1-6F, W, Sp, Su)

797. Dissertation Research. (1-6F, W, Sp, Su)  

799. Continuing Graduate Advisement. (1-3F, W, Sp, Su)  

1Parenthetical numbers preceded by d indicate a dual listing.  
2Descriptions for courses in the 600 and 700 series can be found in the graduate catalog.  
© This course is also offered by correspondence through the Life Span Learning 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, M. David Merrill, Ron J. Thorkildsen, R. Kent Wood; Associate Professors Byron R. Burnham, Andrew S. Gibbons, J. Steven Soulier; Assistant Professors Duane E. Hedin, Linda L. Wolcott; Research Assistant Professors Mark K. Jones, Charles Stoddard, Zhongmin Li; Adjunct Assistant Professor Gary S. Poppleton; Adjunct Instructors Deborah Boutwell, Penny Findlay, Nathan M. Smith, Jr.

Degrees offered: Master of Education (MEd) and Master of Science (MS) in Instructional Technology; Educational Specialist (EdS) in Instructional Technology; Doctorate of Philosophy (PhD) and Doctorate of Education (EdD) in Instructional Technology


Teaching Minor

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's administration or Instructional Technology. 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 18-credit minor in Instructional Technology in conjunction with a major in other fields. The Instructional Technology minor is especially appropriate for fields which require a great deal of instructional communications, such as business, engineering, natural resources, and others.

Requirements for the Instructional Technology minors are as follows:

School Library Media Teaching Minor. Ins T 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.

Instructional Technology Minor. Ins T 100, 516, 544, 635, 678, and 680.

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 Program. This advanced degree program (EdS) should be of interest to those individuals whose career goals do not require a doctorate, but who have need for preparation beyond the master’s level. Persons seeking positions at the district level in public education, junior/community colleges, small four-year colleges, and certain positions in business and industry, should find the EdS degree in Instructional Technology particularly useful. 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) ©

440. Fundamentals of Photography for Interpretation and Education. Introduction to photographic methods and procedures to enable interpreters and teachers to communicate a message visually. (3)

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 this course is required (4F,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 this course is required (2F,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 this course is required (2F,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). 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: This course is required (2F,W,Sp,Su)

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)

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, including 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)

590. Independent Study. Individually directed study and projects. Departmental permission required before registration. (1-6F,W,Sp,Su) ©
**603** (d503). Reading Guidance. (3Su)

*606* (d506). Organizing and Accessing Information. (3Su)

*607* (d507). Library Media Center Administration. (3Su)

**609.** Information Technology and Automation in Library Media Centers. (3Su)

**615.** Media Programs in the Information Age. (3Su)

**616.** Computers in Instructional Technology. (3F,W,Su)

**617** (d522). Design and Development of Microcomputer-based Instructional Software. (3F,Su)

**619.** Computer Applications Using AmigaVision and Related Technologies. (3F,Su)

623 (d523). 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) ©

***636.** LOGO Writer: AI Based Educational Graphics and Word Processing. (3)

627. Computer-assisted Instruction Programming: Authoring Languages. (3W,Su)

**634.** Instructional Development in Education. (3Su)

635. Instructional Development. (3F,Su)

*636* (d536). Foundations of Instructional Technology. (1-3F,W,Sp,Su) ©

637. Videodisc Design and Production. (3W)

**638.** Interactive Learning 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)


646. Principles and Practices of Distance Education. (3Sp)

***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 and Design. (3-9F,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) ©


699. Continuing Graduate Advisement. (1-12F,W,Sp,Su)

705. Internship in Program Evaluation. (1-6) ©

706. Internship in Research. (1-6) ©


744. Instructional Technology Research and Development. (3Sp)

781. Research Seminar. (1F,W,Sp,Su) ©

782. LESIN: Research Review. (3-9F,W,Sp,Su) ©

783. LESIN: Instructional Product Development. (3-9F,W,Sp,Su) ©

784. LESIN: Professional Writing and Publications. (3-9F,W,Sp,Su) ©


791. Independent Research. (1-3F,W,Sp,Su) ©

792. College Teaching Seminar. (1-3F)

796. Practicum. (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.


** Summer of 1995.

*** Taught on demand.

© This course is also offered by correspondence through the Life Span Learning 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

Principal Lecturers Susan Carkin, Glenda R. Cole; Senior Lecturers James E. Bame, Barbara W. Buchanan, Jim Rogers, Thomas J. Schroeder; Staff Assistant III Carol L. Cancio

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 or a Michigan score of 80 and graduate students without a 550 TOEFL score must take the IELI Placement Exam given just prior to the beginning 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 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 1 (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)


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)


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)

265. 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)


253. Academic Discourse for Non-native 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)


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)

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, Laura Musaccio; Adjunct Instructor Scott R. George

Degrees offered: Bachelor of Landscape Architecture (BLA) and Master of Landscape Architecture (MLA) 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.

During the eighth week of spring quarter, the faculty of the department reviews those students having sophomore status in the department. Courses required for sophomore status are LAE 120, 135, 136, 220, 230, 231, 260, 265, 270, 271, and 272; PlSci 261; Math 106; IIE 121; and LAS 125.

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

1Fully accredited by the American Society of Landscape Architects.
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 90 credits earned are also required to complete the LAS 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 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.

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)

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. (4S)

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 Co-operative 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 external 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. (4S)

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 use; 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. (5S)

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. (5S)

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: PISC 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)

408. Future Environments. An introduction to the principles and methods of sprinkler irrigation. Two three-hour studios per week. Prerequisite: LAEP 361. (4Sp)

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. (SF)

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. (SW)

412. Emerging Areas in Landscape Architecture. An exploration of new and emerging areas in the profession of landscape architecture such as land reclamations and visual resource management. Three three-hour studios per week. Prerequisite: LAEP 410. (Sp)

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. (1-6)

426. 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

610. Regional Planning Theory and Inventories. (5F)

611. Regional Planning Analysis. (5W)

612. Regional Planning Policy and Implementation. (Sp)

616. Professional Practice. (2F)

625. Internship and Cooperative Education Program. (1-5)

674. Planning Methods. (3F)

675. Implementation and Regulatory Techniques in Planning. (3W)

685, 686, 687, 688. Seminar. (1F) (1W) (Sp)

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) ©

*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 Life Span Learning 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 Jerry L. Benbow, M. Isela Chiu-Olivares, Mark L. Damen, Lynne H. Goodhart, Iolina Jappinen, Harold J. Kinzer, Mark D. Larsen, Norman R. Savole, Janet C. Stock, Frances Titchener; Associate Professors Emeritus John M. Beyers, Gordon E. Porter; Assistant Professors Taira Koybaeva, Romey Sabalius, Gordon R. Steinhoff, Fuencisla Zomeno; Assistant Professor Emeritus Valentine Suprunowicz; Instructors Nancy R. Birch, Shelley C. Blakeley, Kevin L. Krogh; Principal Lecturer Viva L. Lynn; Lecturer Atsuko Neely; Temporary Instructors Eden Ford, Atsuko Kagami

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, and Arabic combining self-study with tutorial assistance. 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 the 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.

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.

Winter Quarter in Latin America

USU offers qualified students the opportunity to spend winter quarter in Latin America. 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. Self-study with native speaker tutorial. (5) (5)


Mandarin Chinese Courses


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) ©

SK 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) ©

SK 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) ©

SK 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) (5F,W,Sp) (6F,W,Sp)

SK 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)

SK 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)

SK 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. (2P)

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. (3Sp)

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. (1-3Su)


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 context. 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 Novella. In this course students will read and discuss selected German novellen. Brief consideration will be given to the history and style of the novel. (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)

**580. 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 Faust I; 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

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)

310. Ancient Greek Prose: Readings in Plato, Xenophon, Herodotus, and Plutarch. Readings in the Greek prose authors: Xenophon (Anabasis, Cyropaedia,
Italian Courses
SK 101, 102, 103. Elementary Italian. Self-study with tutorial assistance. (5) (5) (5)

Japanese Courses

Korean Courses

Latin Courses
SK 101. Elementary Latin. Students will learn basic Latin grammar, syntax, and vocabulary. Emphasis on memorization, formation, and identification of Latin words. (5)
103. Intermediate Latin. Intermediate study of basic Latin grammar with focus on reading and syntactic analysis. Prerequisite: permission of instructor. (3W)
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 student's 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 student's 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) (5F, W, Sp)

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)
10340. 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 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 (6619).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 SecEd 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) (5F, W, Sp)
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) (5F, W, Sp)

Graduate
617. Modern Composition Theory. (See Engl 617). (3)
619 (6419). 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) (5F, W, Sp)

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)
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
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)

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) (5F, W, Sp)

Languages and Philosophy 167

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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. (3F, W, Sp)

299. Individual Readings. Individual study of selected readings in Russian. Instructor’s permission required. (1-5F, W, Sp)

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. (3F, 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. (3F, 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. (3F, W, Sp)

104. Intensive Elementary Spanish. Intensive alternative course to Spanish 101, 102, and 103 in one quarter, emphasizing active usage. (15Su)

201. 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. (3F, W, Sp)

202. 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: Spanish 201. (3F, W, Sp)

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. (3Su)

303. Advanced Spanish. Taught only winter quarter in Mexico. (5W)

304, 305, 306 Advanced Grammar. An intense review of selected problematic areas of Spanish grammar for students with advanced language skills. (3) (3) (3)

306. Advanced Conversation and Composition. Development of advanced conversation and writing skills through debate and composition on contemporary controversial topics. (5W)

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 the sixteenth century to the present. (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. (5W)

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)

**415. 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 Quijote. (4Sp)

440. Topics of Spanish Literature. Variable topics; course may be repeated with permission of instructor. (3F, W, Sp)

441. Topics of Latin American Literature. Variable topics; course may be repeated with permission of instructor. (3)

**460. Hispanic Literature in Translation. Major hispanic authors in translation. No prior study of Spanish necessary and course may be repeated for credits when course content is different. (3W)

499. Readings and Conference. Individual readings or projects in Spanish. Instructor’s permission required. (1-5F, W, Sp)

Philosophy Courses

HU 101. Introduction to Problems of Philosophy. Introduction to philosophical terminology and ideas. Modern-day problems of reality, thought, and value. (5) (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)


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)


**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; Philosopher's thought in the Renaissance. (4F)

**312. History of Early Modern Philosophy. European thought: Renaissance through eighteenth century. Philosophic ideas in science, religion, logic, ethics, and
epistemology of Descartes, Hobbes, Spinoza, Leibnitz, Locke, Berkeley, Hume, and Kant. (4W)

*313. History of Nineteenth Century Philosophy. European thought from Kant to Nietzsche. Metaphysics, ethics, logic, and theory of knowledge of such thinkers as Bentham, Mill, Comte, Hegel, Schopenhauer, Marx, and Nietzsche. (3Sp)

**315. Twentieth Century Philosophy. Readings and discussion of major philosophies of the twentieth century, including philosophers from Russell to Austin. (3F)

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 aesthetics. (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 postmodern 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, Nietzsche, 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 Aristotle's The Clouds, J.F. Sartre's The Age of Reason, or H. Hesse's Siddhartha. (3W)

**481. 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. An overview of philosophical problems and methods. Capstone course for philosophy honors program. (3F)

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 calculus. Axiom systems and metaphysics. Prerequisite: Phil 210 or approval of instructor. (3Sp)

*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 (6885). Philosophy of Language. Nature and uses of language. Concepts of meaning, reference, truth names, syntax, semantics, pragmatics, metaphors, 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 (6889). 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 (6885). Philosophy of Language. (3Sp)

689 (6490). Philosophy of Science. (3Sp)

690. Independent Study. (1-5F, W, Sp) ©

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)

**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)

Languages and Philosophy 169

*Taught 1994-95.

**Taught 1995-96.

© 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 Lifespan Learning Independent Study Division.

1Parenthetical numbers preceded by indicate a default listing.

2This course is taught every year, but not every quarter. Check with department for current offerings.

These courses are not open to native speakers, unless they are registered Spanish majors and obtain the permission of the instructor.

4This 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, Ross E. Robson; Associate Professor Emeritus Glenn F. Marston; Adjunct Associate Professor Val R. Christensen; Assistant Professors Stephen M. Beckstead, Gaylen N. Chandler, Steven H. Hanks; Senior Lecturers Lawrence H. Siebers, Shari Turnutzer

Degrees offered: Bachelor of Science (BS) and Bachelor of Arts (BA) in Management, BS and BA in Human Resource Management

Objectives

The programs in the Department of Management and Human Resources are designed to prepare men and women for administrative 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.

Management deals with effectively implementing those processes which ensure that organizational objectives are achieved. Examples of these processes include developing mission statements, defining organizational goals, setting priorities, establishing criteria for organizational effectiveness, utilizing appropriate decision making strategies, understanding the internal and external environments, and appropriate strategies for short- and long-term goal accomplishment in a changing and increasingly complex world.

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, planning for retirement, 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 during this period consist of two basic components.

1. College of Business Prespecialization Core. The following courses are required: Acctg 201; BIS 140, 255; Econ 200, 201; Math 105; MHR 100, 299; CS 150 or 170; Stat 230.

2. Department of Management and Human Resources Prespecialization Requirement. The following courses are required for majors in Management and Human Resources: Acctg 203; Math 215; Soc 101 or Psy 101; Spch 260, 305, or BIS 340.

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; Acctg 201, 203, 311; 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.

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 advanced standing in the Department of Management and Human Resources are as follows:

1. Have completed or currently be registered for 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 or currently be registered for 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

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*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).
these courses. Some courses may have prerequisites, which students will be expected to satisfy as well.

3. File a request for advanced standing with the College of Business Student Service Center.

It is strongly recommended that each student make the transition from prespecialization in the college to 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; Econ 400 or 500; Econ 401 or 501.

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 26 credit hours: MHR 360, 364, 455, 461, 463, 469, 476; Econ 521, Econ 566 or BUS 555.

**Major in Management.** In addition to the basic core requirements, students majoring in Management must complete 25-28 credit hours as follows: MHR 360, 364, 414, 415; and 3 courses from a list of approved electives, most of which are outside the College of Business. One elective will be taken from each of the following general areas: (1) Global and Public Environment; (2) Human Behavior and Society; and (3) Science/Technology/Central Systems. 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 supervisory or management responsibilities. The Management minor consists of a minimum of 24 credits. The following courses are required: MHR 299, 311, 360. In addition, four courses must be selected from the following: MHR 364, 414, 415, 461; Econ 520, 521.

**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 personnel/human resource functions of an organization. The Human Resource Management minor consists of a minimum of 24 credits. The following courses are required: MHR 311, 360, 364. In addition, four courses must be selected from the following: MHR 299, 455, 461, 463, 469, 476; Econ 566 or BUS 555; Econ 521.

**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 both undergraduate and graduate students.

**Sigma Iota Epsilon (SIE) is the National Honorary Management Fraternity.**

**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 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. Orientates freshmen and transfer students to College of Business programs, academic and student services, professional organizations, and career possibilities. (1F,W,Sp,Su)

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-F,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. (NSp) ©
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)

311. Management and Organizations. Survey of traditional and current
management issues (e.g. planning, organizing, controlling, international business)
combined with organizational behavior topics (e.g. interpersonal communication,
leadership, motivation). Prerequisite: Junior-level standing. (4F,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)

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. Human Behavior in Organizations. Development of managerial competencies
in individual, interpersonal, and group processes such as motivation, communication,
problem solving, and conflict. Emphasis on experiential learning. Prerequisite: MHR
311. (4F,W,Sp,Su)

Management function from the perspective of a business generalist. Consideration
given to key legislation and current issues. Prerequisite: Junior level. (4F,W,Sp)

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.
Prerequisites: MHR 311 and BA 350 or consent of instructor. (3F,W,Sp,Su)

414. Organization Theory. Investigates the structure and functioning of
organizations through examination of the environment, technology, organizational
design, conflict, power and influence relationships, institutional change, and
behavioral implications. Prerequisites: MHR 311, 360. (4F)

415. Management Seminar. Contemporary topics in management, such as global
competition, innovation, technology, productivity, quality, and other emerging issues.
Review and development of these and other topics through use of readings, case
studies, and executive lectures. Prerequisites: MHR 311, 360. (4W)

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 of 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. Prerequisites: MHR
311, BA 340, 350, 370. (4Sp) ⊗

455 (d65S). Staffing Organizations. Methods and principles of staffing
organizations, including job analysis, recruitment, statistics, affirmative action,
criterion measurement, selection, and interviewing. Prerequisite: statistics. (3)

461 (d661). Human Resource Planning and Performance Appraisal. Human
Resource Planning and its relationship to business strategy, labor market analysis,
career planning, performance management, and the legal environment for
performance appraisal. (3F)

463 (d663). Compensation Administration. Analysis of compensation policies and
programs, job evaluation programs, job pricing, wage and salary surveys,
administration, and other related problems. Prerequisite: statistics. (3W)

469. Problems and Policies in Human Resource Management. Application of
principles and policies to personnel and human resource problems in organizations.
(A capstone, integrative course for majors and minors.) Prerequisites: senior standing
in HRM; MHR 455, 461, and 463. (3Sp)

476 (d676). 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)

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.
(15p)

489. Business Policy. A capstone course to develop perspective, judgment, and
facility in solving problems in production, distribution, personnel, finance, control,
(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)

593 (d601). 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

600. Survey of Business Law. (3)

601 (d501). Advanced Business Law. (4Sp)

609. Survey of Management and Organizational Behavior. (4F)

625. Graduate Internship. (1-6F,W,Sp,Su)

655 (d455). Staffing Organizations. (3)

661 (d661). Human Resource Planning and Performance Appraisal. (3F)

662. Human Resources Management. (3W)

663 (d463). Compensation Administration. (3W)

664 (d564). Selected Topics in Management and Human Resources. (1-4)

665. Interpersonal Effectiveness in Management. (3)

666. Organizational Leadership, Influence, and Change. (3)

667. Labor Relations. (3)

669. Human Resource Policy and Strategy. (3)

676 (d476). Employment Law. (3)

681. Management and Organizational Behavior. (4)

683. Business and Society. (3)

686. Management of Technology/Innovation. (3)

689. Business Strategy. (4)

690. Independent Research and Reading. (1-5) ⊗

696. Professional Paper. (4)


699. Continuing Graduate Advisement. (1-3F,W,Sp,Su) ⊗

1Parenthetical numbers preceded by d indicate a dual listing.
2Descriptions 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 Life Span Learning
Independent Study Division.
Department of Mathematics and Statistics

College of Science

Head: Professor Jerry Ridenhour
Office in Lund Hall 220, 797-0244
Associate Head: Professor Chris S. Coray
Office in Lund Hall 220, 797-2811


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 option in 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 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 21-26 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) Phys 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, 420, 521, 522, and 523 are required. Students must also elect 27 credits of mathematics courses at the 500 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.

**Bachelor of Science in Mathematics (Computational Option).** A student may choose this option rather than the regular BS degree described above. The coursework is intended to cover a wide range of topics in the area of numerical and computer analysis. Required courses are Math 320, 321, 420, 521, 522, 523, 561, 562, 563; CS 170, 171, 172, 220, 227, 327. The student must also elect 9 credits of mathematics courses numbered above 500 and 9 credits of computer science courses numbered above 400.

**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, 420, 521, 522, 523; Phys 221, 222, 223, 341, 342, 343, 387, 388, 398, 461, 462, 463, 471, 472. Also, the student must elect 18 credits from mathematics courses numbered above 500 and complete at least one of the Physics sequences 401, 402 or 411, 412 or 451, 452.

The **Mathematics-Statistics** major requires the following courses: Math 220, 221, 222, 320, 321, 322, 420, 521, 522, 523, 571, 572, 573; Stat 301, 502, 505. Also, students must take 6 credits in Math courses numbered above 500 and 6 credits in Stat courses numbered above 500.

The **Mathematics-Electrical Engineering** major requires completion of all EE required courses, including Phys 221-223, plus the following mathematics courses: Math 220, 221, 222, 320, 321, 322, 420, 521, 522, 523, 571, 572, 573; Stat 301, 502, 505. Also, students must take 6 credits in Math courses numbered above 500 and 6 credits in Stat courses numbered above 500.

**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, 305, 311, 312, 320, 321, 322, 331, 371, 384, 420, 461, and Stat 201. It is recommended that students take CS 170 to fulfill the computer literacy requirement of the professional education component. 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 27 credits of electives include Math 311, 312, 531, and 571.

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, 305, 311, 371, and 384.

**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, 322, 571, 572, 573; Stat 301, 502, 505; CS 170, 171, and 241. Students must also elect 12 additional credits from statistics courses numbered above 400. Up to 6 credits from Math 352, 353, 558, 559, 561, 576, 577 may be counted toward the 12 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, 557, 558, 559, 571, 572, 573; Stat 301, 502, 505; CS 241; Acctg 201, 203; BA 308, 321, and 340. 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. 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 571, 572, 573, or 576. 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. (3F) ☐


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. (3F, W, Sp, Su) ☐

108. 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. Prerequisite: A grade of C- or better in Math 101, or a math ACT score of at least 22, or a satisfactory score on a placement exam. (3F, W, Sp, Su) ☐

105. College Algebra. Must have a graphics calculator. Emphasis is on understanding the mathematics necessary to prepare students for mathematics courses. Those wishing a deeper understanding of calculus should enroll in the Math 220, 221, 222 sequence. Prerequisite: Math 105. (3F, 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 some special functions. 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. (3F, W, Sp, Su) ☐

107. Calculus Techniques. Techniques of elementary calculus of functions of one variable, including differentiation and integration, with applications to biological, physical, and social sciences. Emphasis is on understanding the mathematics necessary to teach at the elementary school level. Prerequisite: 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) ☐

115. Calculus Techniques. Techniques from calculus of several variables including partial differentiation, multiple integration, optimization, and differential equations. Prerequisite: Math 215. (3F, W, Sp, Su) ☐

201, 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. Prerequisite: 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, Su) ☐

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). Prerequisite: Math 105 and 106 or equivalent. (3F, W, Sp, Su) (3F, W, Sp, Su) (3F, 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. (1-4F, W, Sp, Su) ☐

281. Topics In Mathematics (Topic). Topics in mathematics at the lower division level. (1-5)

305. Foundations of Algebra. Required of all mathematics teaching majors and minors. Introduction to logic, sets, mathematical induction, relations, and functions, together with a study of topics from abstract algebra. Prerequisite: Math 222. (3F)


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. Prerequisite: Math 221 or consent of instructor. (3W) (3Sp)


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) ☐


323. 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. (3W, Sp)

371. Introduction to Probability. An introductory mathematical treatment of uncertainty. Topics include probability spaces, combinatorics, the binomial and normal random variables, special distributions, independence, expected values, and applications. Prerequisite: Math 221. (3W)

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. Prerequisite: Math 221 or consent of instructor. (3Sp)


420. Foundations of Analysis. Fundamental concepts of analysis studied from a rigorous point of view. Emphasis on learning how to develop proofs. Prerequisite: Math 320 or consent of instructor. (3F, W, Sp, Su) ☐

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. (1-4F, 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, Sp, Su) ☐

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)

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)

557, 558, 559. 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) (3Sp) 2

531, 532, 533. Modern Algebra. Fall quarter: introductory group theory. Winter and spring quarters: rings, fields, and representations. Prerequisites: Math 320, 321, 322. (3F) (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)


543. Methods of Applied Mathematics III. Integral equations, stability and bifurcation analysis, and/or other topics. Prerequisites: Math 322 and 542. (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

1See introductory paragraph. Placement of New Students. This course also requires extra fees.
**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 573 and consent of the instructor. (3F) (3W) (3Sp) 2

561. Numerical Analysis I. Direct solution of linear systems, Gaussian elimination with pivoting, Cholesky decomposition, QR factorization, power and QR 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. Prerequisite: Either Math 561 or 542. (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 560, 571, 572, 573. (5W) (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)

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) ©

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**Graduate**

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)

631, 632, 633. Modern Algebra. (3) (3) (3)

634, 635, 636. Matrix Theory and Linear Algebra. (3) (3) (3)

641, 642, 643. Ordinary Differential Equations. (3) (3) (3)

651, 652, 653. Topology. (3) (3) (3)

661, 662, 663. Numerical Analysis. (3) (3) (3)

664, 665, 666. Optimization. (3) (3) (3)

671, 672, 673. Probability Theory. (3) (3) (3)

680. Seminar. (1-5) ©

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

786. 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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**Statistics Courses**

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)


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) ©


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 (6605). 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 equivalent. (3F)

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 502. (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 502 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 Stat 505/605. (3W)

**660. 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) (1-5Sp) 2 ©

597. Seminar. Review of current literature and developments in the field of statistics. (1-3) ©

Graduate


605 (4595). Linear Regression. (3F)

**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)

606, 607, 608. Multivariate Analysis. (3F) (3W)

675. Practical Statistical Consulting. (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) ©

*Taught 1994-95.

**Taught 1995-96.

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

1Parenthetical numbers preceded by an indicate a dual listing.

2Not all courses are offered each year. Check with the department for current offerings.

3Descriptions 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 (Acting Dean, College of Engineering), Warren F. Phillips, Edward W. Vendell, Jr.; Professors Emeritus Owen K. Shupe, W. Karl Somers, Carl D. Spear; Adjunct Professors Larry H. Brim, Robert H. McEntire, David G. Norton; Associate Professor R. Rees Fullmer; Adjunct Associate Professor Don G. Ferney; Assistant Professors Steven L. Folkman, Thomas H. Fronk, Glenn A. Gebert; Lecturer Lewis D. Myers

Degrees offered: Bachelor of Science (BS), Master of Science (MS), 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**


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)


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-aided Design. Fundamentals of computer-aided engineering design and computerized engineering graphics; includes design project. Prerequisites: Engr 103 and Math 221. (3F, Sp)
310. Manufacturing Processes. Identification, selection, limitations, and application of processes used in industrial production. Material properties as related to processing and product design are considered. (3)

311. Design for Manufacturability. Links the design features of a product with the manufacturing processes required to produce the product, emphasizing the concept of design for manufacturability. (3P)

331. Thermodynamics. Energy and entropy concepts, irreversibility, availability concepts, ideal mixtures, psychrometrics, general property relations. Prerequisites: Engr 330, MAE 276. (3W)

334. Heat Transfer. Analytical, numerical, and experimental studies of how energy is transferred by conduction, convection, and radiation. Prerequisite: Engr 330, MAE 354. (3W)

335. Heat and Mass Transfer. Analytical, numerical, and experimental studies of how energy is transferred by conduction, convection, and radiation. Prerequisite: MAE 334. (3Sp)

389. Design Project. Three lectures. Prerequisite: MAE 487, 472 (or concurrent). (4F)

471. Computer-aided Engineering Design of mechanisms; linkages; cams; gears; gear trains; synthesis of mechanisms. Prerequisite: Engr 203 and MAE 354. (3W)

475. 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 (concurrent) and Engr 203, 330. (3F)

475. Fluid Transport Theory II. Continuation of MAE 354. Prerequisite: Engr 330 and MAE 354. (3W)

471. Kinematic Design. Computer-aided engineering design of mechanisms; linkages; cams; gears; gear trains; synthesis of mechanisms. Prerequisite: Engr 203, MAE 276. (3Sp)

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: Phys 223, Chem 122. (4W)

476. Thermal Environmental Design. Air conditioning and heating, solar utilization, thermal environmental control, laboratory exercises, design project. Prerequisites: MAE 331, 335 (concurrent), and 355. (3Sp)

503. Orbital Mechanics. Classical two-body orbital mechanics; orbit determination, basic orbital maneuvers, time of flight, lunar and interplanetary trajectories, and perturbation methods. (3F)

504. Advanced Mechanics of Materials. Continuum mechanics applied to airplane and spacecraft structures. Includes topics on strength of materials, thin-walled structures, and energy methods with associated structural analysis techniques. Prerequisites: Math 230, 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. Prerequisite: MAE 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. Two lectures, one lab. Prerequisite: MAE 211, 276. (3F)

514. Material Science. Structure of crystalline and noncrystalline materials; phase equilibria; surfaces and interfaces; imperfection and flow of matter. A quantitative treatment of material properties. Prerequisite: MAE 415 or instructor's consent. (3Sp)

**521. Computer-aided Manufacturing. Computer fundamentals, interface electronics, and microprocessor utilization pertaining to manufacturing engineering. Prerequisite: MAE 211 and EE 392. (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. Prerequisites: MAE 211, 513 (concurrent), 520, 521. (3Sp)

523. Robotics. Overview of robotics as a manufacturing technology, applications, geometries and kinematics of five and six axis robots, tooling and assembly operations, programming and control. Prerequisite: Engr 203. (3F)

524. Automation Systems. Introduction to classical feedback control systems with emphasis on design fundamentals using t, s, and w domain concepts to determine stability and dynamic response of electromechanical, hydraulic, and pneumatic systems. Prerequisites: EE 308, Engr 203. (3W)

525. Hydraulics and Pneumatics. Fluid power and controls as applied to machine tools. Two lectures, one lab. Prerequisite: MAE 355. (3Sp)

527. Quality Control. Quality control techniques and systems for industry. Prerequisite: MAE 211. (3)

540. Aerodynamics. Dynamics of an incompressible, inviscid flow field; characteristic airfoil parameters; incompressible flow around two-dimensional airfoils and thin 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 (6645). 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)

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. Dynamic System Modeling. Introduces modeling of dynamic systems for on-line control of processes using autoregressive and autoregressive moving average models. Prerequisite: MAE 524. (3Sp)

*576. Production Tool Design. Design of special tooling, jigs, and fixtures for economical production. Emphasis placed on pre-design analysis, cutting force analysis, locating, positioning, and clamping requirements. Two lectures, one lab. Prerequisite: CEE 305. (3W)
Graduate

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 Aerodynamics. (3Sp)
608. Advanced Mechanics of Composite Materials. Prerequisite: CEE 305. (3)
617 (IS17). Ceramics and Plastic Materials. Prerequisite: MAE 415. (3)
621. Manufacturing Simulation and Optimization. Prerequisite: MAE 310. (3)
623. Robotics. Prerequisite: MAE 523. (3)

*630, 631. Thermodynamics. Prerequisite: 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 335. (3)
636. Convective Heat and Mass Transfer. Prerequisite: MAE 335. (3)
637. Conductive Heat Transfer. Prerequisite: MAE 335. (3)
638. Radiation Heat Transfer. Prerequisite: MAE 335. (3)
642. Aeroelasticity. (3F)

**645 (4545). Direct Energy Conversion. (3)
646. Solar Energy Systems. (3)
652. Viscous Fluid Flow. (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. (3)
676. Hydraulic Transients. Prerequisites: CEE 351 or MAE 355. (3Sp)
680. Seminar. (1) @
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. (3)
705. Elastic Theory. Prerequisite: instructor’s consent. (3)
735. Special Topics in Heat Transfer. Prerequisite: instructor’s consent. (3)
736. Computational Heat Transfer. Prerequisite: instructor’s consent. (3)
753. Advanced Control Theory. Prerequisite: EE 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) @

1Parenthetical numbers preceded by d indicate a dual listing; parenthetical numbers preceded by an f are the former course numbers.
2Descriptions for courses in the 600 and 700 series can be found in the graduate catalog.
3Taught 1994-95.
4Taught 1995-96.
© 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 Reed Critchfield
Office in Military Science 104, 797-1820

Assistant Professor MAJ David Stock (Ricks College)

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 program. The quarterly lab fee for cadets in the advanced program is $10.

3. Commission Requirements. To be commissioned in the U.S. Army, a student must:
   a. Qualify for entrance into the advanced program.
   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 $100 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 $1,000 per school year while the cadet is completing the ROTC program. USU also offers dormitory rooms at $300 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 practicing drill and ceremony skills.

Military Science Courses

101. Introduction to Military Science and Leadership. History of the Army and ROTC with emphasis on contemporary military skills and leadership principles. (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) Ⓞ


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 PM communications. (25p)

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,5a) (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. (25p) ©

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. (1-3F) (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,5,W,5Sp)

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,5,W,5Sp)

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

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**Department of Music**

**College of Humanities, Arts and Social Sciences**

**Head:** Associate Professor Bruce M. Saperston

**Office in Fine Arts Center 107, 797-3000**

**Professors** Gary Amano, Warren L. Burton, Michael K. Christiansen, Willard R. Keeling, F. Dean Madsen, Larry G. Smith; **Professors Emeritus** Max F. Dalby, Glen A. Fifield, Alvin Wardle, Irving Wassermann; **Associate Professors** Michael L. Ballam, James M. Drake, Mark A. Emile, Dennis D. Griffin; **Associate Professor Emeritus** Mildred Johnson; **Assistant Professors** Betty Beecher, Todd L. Fallis, Nicholas E. Morrison; **Lecturers** Bonnie Slade, Leslie Timmons, Marla Volovna; **Applied Music Staff** Susan Ames, Laurie Bean, John Carter, Derek Furch, Betty Hammond, Chiyo Honma, Carolyn Jones, J'Lene Mendenhall, Deborah Monday, Michael Packham, Pat Swasey, Susan Swidnicki; **Music Therapy Assistants** Lisa Almond, Karen Carter

**Degrees offered:** Bachelor of Arts (BA) in Music; Bachelor of Music (BM) in Music Education, Performance, and Piano Pedagogy; BS in Music Therapy; Master of Education (MED) in Secondary Education with emphasis in Music

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*USU's Music Department is accredited by the National Association of Schools of Music.
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) 797-3000.

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 fulfills 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 instrument, or percussion. Major requirement sheets listing specific courses of study for each area of emphasis are available through the Music Department office, Fine Arts 107.

Bachelor of Arts Degree in Music

A Bachelor of Arts Degree in Music requires 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 (25-30 credits). Other requirements include 6 credits of English, a 63-credit minor in Liberal Arts and Sciences, 52 credits of core music courses, 21 credits of musical performance, and 20 credits of University electives. A list of specific courses required and/or recommended may be obtained from the Music Department office, Fine Arts 107.

Bachelor’s 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 serve in the education and therapy of 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 107. Students must complete an application process through the Music Department in order to be accepted for the Music Therapy major.

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) O


183. Introduction to Music Education. Required of all freshman music education majors. (3P)
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: Music 104. (3Sp)

106. Traditional Harmony III. Traditional harmony and four-part harmonizations in vocal style continued. Prerequisite: Music 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: Music 107. (1W)

109. Music Skills III. Sight-singing: rhythmic, melodic, and harmonic dictation; keyboard harmony; computer-assisted instruction continued. Prerequisite: Music 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. (3Sp)

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 non vocal 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 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)

189. 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)

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. Observation and Orientation in Music Therapy. Students will learn systematic observation and recording methods used in music therapy practice. (1Sp)

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)

250. Fingerboard Theory III. Students will be taught how to arrange and compose music for the guitar using more advanced principles of music theory. (2Sp)

240. Music Awareness and Response. A participatory music class, not requiring previous musical training, performance skills, or theoretical knowledge. Will help students become more aware, perceptive, and responsive to the aesthetic qualities of music. (2W)

241. Music Skills IV. Sight-singing: rhythmic, melodic, and harmonic dictation; continued. Prerequisite: Music 109. (1F)

242. Music Skills V. Sight-singing: rhythmic, melodic, and harmonic dictation; continued. Prerequisite: Music 241. (1W)

243. Music Skills VI. Sight-singing: rhythmic, melodic, and harmonic dictation; continued. Prerequisite: Music 242. (1Sp)

245. 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—Baroque Period. History and literature of the music of the Baroque Period, 1600-1750. (2F)

302. Music History—Classic Period. History and literature of the music of the Classic Period, 1750-1820. Prerequisite: Music 301. (2W)


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)

306. Music History—Early and Renaissance Music. Early, Medieval, and Renaissance history, literature, and musical techniques. (2)

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)

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, 322. Psychology of Music. Research and laboratory course emphasizing physical, perceptual, psychological, and pedagogical bases of music behavior. (3W) (3Sp)

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 rehearsals, literature selection, conducting, and playing minor instruments. (1Sp) •


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)


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 Broadway musical or operatic stage production. Music 135 recommended as a prerequisite. (1-3W, Sp) •

336. University Chorale. A selected mixed concert chorus performing a wide range of choral literature. Admission by audition. (1F, W, Sp) •

337. Fundamentals of Baton Technique. Prerequisite to Music 340 or Music 341. (3F, Sp)

339. Intermediate Choral Conducting. Techniques of choral conducting and interpretation of choral music. Prerequisite: Music 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: Music 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)


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)

355. Vocal Repertory I. Survey of German Lieder, English Art Song, and French Chanson, including styles, history, and performance practice. (3F)

356. Vocal Repertory II. Survey of operatic repertoire from Monteverdi's "Orfeo" to the Twentieth Century, including styles, history, and performance practice. (2W)

357. Vocal Repertory III. Survey of Twentieth Century vocal music of American Broadway musicals and operetas, including styles, history, and performance practice, and a survey of modern vocal music 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. (1F, W, Sp, Su) •

365. Teaching Singing to Children. Understanding of 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) •


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)

392. Music for Winds and Percussion. Introduction to significant music written for wind and percussion instruments during past three centuries; survey of band literature appropriate for secondary school bands; listening assignments. (3F)

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)**
496. Senior Thesis. 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)

497. 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)

498. 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. (25p)

410. Music Therapy: Influence of Music on Behavior. The effect of music on the
physical, social, cognitive, and communication skills of persons with disabilities. (4P)

411. Music Therapy: Methods and Procedures. Applications of music therapy with
individuals in psychiatric settings. (4P)

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)

459. Preseminar 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 Conferences. An undergraduate course designed to provide
special interest study. (1-3F,W,Sp,Su)

496A. 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)

498A. 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.
(2Sp)

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
eensembles 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: Music 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: Music 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 and computer equipment. Prerequisite: Music 222. (2-2Sp) ©

Graduate

600 (500). 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 Performace. (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. (3-5) ©

699. Continuing Graduate Advisement. (1-3) ©

*Descriptions for courses in the 600 and 700 series can be found in the graduate
catalog.

**Parenthetical numbers preceded by an * 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 Life Span Learning
Independent Study Division.

*Taught 1994-95.
**Taught 1995-96.
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 Emstrom, Gary H. Richardson, D. K. Salunkhe; Assistant Professor Emeritus Frances G. Taylor; Professors Rodney J. Brown, Deloy G. Hendricks, Von T. Mendenhall, Bonita W. Wyse; Associate Professors Charlotte P. Brennand, Charles E. Carpenter, Daren P. Cornforth, Conly L. Hansen, Georgia C. Lauritzen, Donald J. McMahon, Paul A. Savello, Carol T. Windham; Assistant Professors Jeffery R. Broadbent, Bart C. Weimer; Clinical Assistant Professors Nedra K. Christensen, Noreen B. Schvaneveldt; Clinical Instructor Janet B. Anderson

Degrees offered: Bachelor of Science (BS), Master of Science (MS), 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, and Nutrition Science

Objectives

The Department of Nutrition and Food Sciences prepares students for careers in either food science or human nutrition. 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 hospitals, clinics, community health programs, and as consultants in homes for the aged and other service institutions. Nutrition science students are educated in human nutrition and are well prepared for graduate school.

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 registered dietitians. The program is accredited by the American Dietetic Association as a Coordinated Undergraduate Program in Dietetics (CUP). Upon completion, graduates are eligible for entry-level positions in hospitals, community or government agencies involved in nutrition care programs, and out-patient clinics. Students spend sixteen weeks in Salt Lake City during the senior year gaining experience in medical facilities. Students must complete prerequisite courses and apply for enrollment in the dietetics program by May 1 of the sophomore year. Application forms can be obtained from the department.

Nutrition Science. This emphasis is for students who want a solid background in human nutrition. It provides a thorough scientific base as preparation for graduate or professional study in nutrition, medicine, veterinary medicine, or dentistry or for careers in research laboratories of universities, government agencies, or food industries.

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 three 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.

NFS Freshman Year Core. The following courses are required for all students in the emphasis areas in Nutrition and Food Sciences: Biol 125; BIS 140; Chem 121, 122, 123, 124, 160; Econ 200; Engl 101, 201; Fl 110; Math 105; NFS 101, 122.

Food Science Emphasis. The following core classes are required for all students in the Food Science Emphasis: ASTE 305; ADVS 202; Chem 331, 332, 333, 334, 370, 371; Math 106, 215, 216; Micro 301; NFS 235, 310, 407, 408, 444, 492, 493, 502, 503, 506, 511, 550, 551, 556, 557; Phys 111; Stat 301, 502, 508.
take courses for one of the sixteen depth areas: Food Industry, Food Engineering, Food Chemistry, Food Microbiology, Consumer, International, Dairy Foods, Meat, Liberal Arts and Sciences, Sensory Evaluation, Premedicine, Nutrition, Statistics, Food Law, and Agribusiness. (For more information, see department specification sheet.)

Dietetics Emphasis. ASTE 305; Chem 331, 332, 370, 371; MHR 311; NFS 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; Physl 130; Soc 101; Stat 201.

Nutrition Science Emphasis. ADVS 202, 549; ASTE 305; Biol 126, 127; Chem 331, 332, 334, 335, 370, 371; Math 106, 215, 216; Microb 111, 112; NFS 301, 322, 407, 408, 440, 442, 443, 448, 499, 530, 531, 543, 550; Physl 111, 112; Physl 103, 130, 501, 502, 505; Psy 121; Stat 301, 502.

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

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,3W,3Sp)

512. 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,3W,3Sp)


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. (4Sp)

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)

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. (4Sp)


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,3W,3Sp)

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. (3Sp)

465. Education in Clinical Dietetics. Principles of education, counseling, and communication as applied to the field of nutrition education and clinical dietetics practice. One lecture, one lab. (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 331. (3W) (3Sp)

430. 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. (3F)

442, 443. Clinical Nutrition Methodology. Development of experimental design, data collection in laboratory or clinical setting, statistical analysis, interpretation, and integration of results. (2W) (3Sp)

444. Food Engineering. Basic engineering concepts and their application. Definitions, nomenclature, conservation of mass, first and second laws of thermodynamics, pyrometrics, simple power, and refrigeration cycles. Prerequisites: Physl 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)


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. (1W)

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. Prerequisite: NFS 457, 458. (12W)

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, fiscal controls, human and labor relations, employee training, layout, and sanitation. Three lectures, one lab. Prerequisite: NFS 471. (6Sp)


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. (6W)

490. Special Problems. Individual problems and research problems for upper division students in Nutrition and Food Sciences. (1-4F,3W,3Sp)

492, 493. Food Technology. Capstone courses that incorporate and unify the principles of food chemistry, microbiology, engineering, processing, nutrition, sensory analysis, and statistics. Prerequisite: senior standing. (2W,2Sp)
499. Nutrition and Food Science Seminar. Student reports on current topics in Nutrition and Food Science. (15p)  
503 (d693). 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)  
506 (d696). Principles of Food Processing. Standardization and compounding food products; food preservation through application of heat, refrigeration, concentration, and dehydration. Basic unit operations in the food industry. Quality control of raw and finished products. Four lectures, one lab. Prerequisite: NFS 544. (5Sp)  
511 (d691). Food Microbiology. Microorganisms in food production, preservation, spoilage, poisoning, and sanitation. Prerequisite: Micr 111 and 112, or Micr 301. Three lectures and two labs. (5W)  
513 (d693). Food Fermentations. The microbiology and biochemistry of food fermentations. Prerequisite: NFS 511/691. Three lectures and one lab. (4Sp)  
515 (d651). 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: Micr 301. (4F)  
530 (d693). 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)  
540. Human Nutrition—An Integrated Approach. An Independent Study Division course (3)  
**543 (d693). Human Nutrition from Preconception through Early Childhood. Relation of nutrition to growth from the prenatal period to old age. (3F)  
544 (d694). Food Engineering. Introductory concepts in fluid mechanics and heat transfer. Engineering measurement techniques presented in the laboratory. Prerequisite: NFS 444. (3W)  
550 (d659). 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 331, 332, 370, 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 R.D. (1-10W, Sp)  
576 (d676). Dietetics Management Practicum. Advanced practical experience in food service management for dietetics. Prerequisite: NFS 472 or R.D. (1-10W, Sp)  

Graduate  
621. Dietary Guidance in Family and Societal Contexts: Issues and Applications. (3Sp)  
623 (d672). Meat Processing. (5W)  
630 (d675). Dairy Processing. (5F)  
632 (d676). Principles of Food Processing. (5Sp)  
636. Sensory Evaluation of Foods. (4Sp)  
660. Food Systems. (4W)  
671. Food Microbiology. (5W)  
675. Dairy Fermentations. (4Sp)  
676 (d676). Dairy Fermentations. (4F)  
677. Food Science. (4F)  
680. Special Problems. (1-4F, W, Sp, Su)  
699. Continuing Graduate Advisement. (1-12F, W, Sp, Su)  
714. Biotechnology of Lactic Starter Cultures. (4Sp)  
780. Seminar. (1F, W, Sp)  
799. Continuing Graduate Advisement. (1-12F, W, Sp, Su)  

*Parenthetical numbers preceding by d indicate a dual listing.  
2Descriptions 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 Life Span Learning Independent Study Division.  
*Taught 1994-95.  
**Taught 1995-96.
Department of
Physics
College of Science

Head: Professor W. John Raitt
Office in Science Engineering Research 250A, 797-2857

Assistant Head: Associate Professor O. Harry Ottesen


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.

Note: The above Bachelor of Science requirements are not in effect for the Bachelor of Arts degree.

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. At least the core upper division physics courses are required. This core set of courses consists of Phyx 341, 342, 343, 374, 411, 412, 451, 452, 461, 462, 463, 471, 472, and 473 or 474; a total of 46 credit hours. An additional 4 credit hours of upper division laboratory (Phyx 387, 388), and 389 or 2 credit hours of senior project (Phyx 398) are required. Contact the Department of Physics for sample course selections and core course syllabi.

Minor. Students majoring in other departments may earn a physics minor by taking at least 18 credits (at least 12 must be upper division) in a program determined by consultation with this department. A minor is not required for a student majoring in physics.

Specialization in Biophysics. Students wishing to pursue an undergraduate program in preparation for graduate work in biophysics should enroll as physics majors and should consult with the department head or assistant department head on this program.

In general, such students should fulfill all requirements for a physics major and should, in addition, take as much biology and chemistry as they can manage. Consultation with members of the Biology Department faculties will be sought in their advisement. A program will be worked out between the student and advisers to meet the student’s individual needs.

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, 387, 388, 398, 411, 412, 451, 452, 461, 462, 463, 471, 472, and one of the following sequences: Phyx 401 and 402, 411 and 412, 451 and 452; Math 220, 221, 222, 320, 321, 322, 420, 521, 522, 523, and 18 additional credits of mathematics with prefixes of 400 or above. The total required courses for the two degrees is 108 credit hours. Contact an adviser from either department.

Teaching Major. The following courses are required for a teaching major in physics: Phyx 221, 222, 223, 341, 342, 387, 388, and 389. Six credits in upper division electives are selected from: Phyx 342, 374, 411, 412, 451, 452, 461, 462, 471, and 472. Ten credits of general electives are selected from: Phyx 100 or 108 or 318, 342, 343, 374, 391, 392, 393, 398, 413, 473, 474, and 505; Mathematics through Math 322; Stat 201; and Sci 430. Physics
teaching majors plan their own 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.

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, Geology, 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: Chem 121, 122, 123, 124, 160, 334; Chem 331 and 332 or Chem 141 and 142; Phyx 221, 222, 223; 9 credits selected from Phyx 216, 318, 374, 387, 388, 389, 505; BioM 200 or 530; GeoL 111, 305; Math 220, 221; Stat 201; Sci 150, 430. Students seeking this degree must complete the requirements for the Professional Education Component for Teaching Degrees.

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 non-science majors. (5F, W, Sp)

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. Taken in sequence except with the permission of the instructor. Prerequisites: Math 105, 106. (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 non-science majors requiring a laboratory course. (5F: W, Sp)

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. Prerequisites: Math 106, Phys 120. (3F)

PS 216. Energy. A study of energy resource, 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. Taken in sequence except with the permission of the instructor. Recitation and lab. (5F: Sp, Su) (5W: Su) (5W: Sp, Su)

PS 224, PS 225, PS 226. Physics ProSeminar. Honors course. To be taken concurrently with Phyx 221, 222, and 223. (1F) (1W) (1Sp)

PS 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. (3W)

PS 341, PS 342. Analytical Mechanics. Newtonian mechanics, single particle motion, central forces, systems of particles, rigid bodies, Lagrangian mechanics, and Hamiltonian mechanics. Prerequisites: Phys 221, 222, 223, and differential equations or permission of the instructor. (4F) (4W)


PS 344. Introductory Modern Physics. Concise overview of modern physics at the intermediate level. Includes special relativity, wave and particle properties of matter and energy, introduction quantum mechanics, and the fundamentals of atomic, molecular, particle, and solid state physics. Prerequisites: Phys 221, 222, and 223. (3Sp)

PS 387, PS 388, PS 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: Phys 221, 222, 223, (2P) (2W) (2Sp)

PS 391, PS 392, PS 393. Selected Reading in Physics. (1F) (1W) (1Sp) ©

PS 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 available for Senior Project. (1-3F, W, Sp) ©

PS 401, PS 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: Phys 221, 222, 223. (3W) (3Sp)

PS 411, PS 412, PS 413. Wave Theory and Optics. Wave motion, geometrical optics, diffraction phenomena, aberrations, interference, polarization, and sundry topics in contemporary optics. (3F) (3W) (3Sp)

PS 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. (1-3F, W, Sp, Su)


PS 471, PS 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: Phys 374, Math 321, and either Phys 341 and 342 or Phys 461, 462, and 463. (4F) (4W)

PS 473. Nuclear and Elementary Particle Physics. Applications of the principles of quantum mechanics to nuclear and elementary particle physics. This includes modeling the nucleus, particles (including quarks and leptons), and their interactions. Prerequisites: Phys 471 and 472. (3Sp)

PS 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 471 and 472. (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 or 223 and Biol 125. (3F,5p)

525. Topics in Physics (Topic). Independent or group study of physics topics not covered in regular course offerings. (1-6)

**533. Relativity. Einstein's special and general theories of relativity and gravitation using four-vector and tensor formulation. Prerequisite: a knowledge of Maxwell's equations and Lagrangian and Hamiltonian mechanics. (3Sp)


581, 582, 583. Physics Colloquium. A series of invited lectures on specialized topics in physics and related subjects. (1F) (1W) (1Sp) ®

Graduate

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. Theoretical Mechanics. (3F) (3W)

**651, 652, 653. Statistical Mechanics. (3F) (3W) (3Sp)

**657, 658, 659. Applied Plasma Dynamics. (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) ®

1Descriptions for courses in the 600 and 700 series can be found in the graduate catalog.

2These specialty courses are taught on an irregular basis. For information about when they will be taught, contact the Physics Department.

*Taught 1994-95.

**Taught 1995-96.

© 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 H. Grant Vest
Office in Agricultural Science 322-C, 797-2233

Assistant Head: Professor William F. Campbell
Office in Agricultural Science 320, 797-2246


Degrees Offered: BS in Crop Science, Horticulture, Environmental Soil/Water Science; MS and PhD in Biometeorology, Plant Science, Soil Science, Ecology (plant or physical)


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 Agriculture, 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 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; Binet 530; Bot 440, 510; Geol 111; PlSci 100; PlSci 476 or Biol 586; PSB 105, 489; Soils 200, 358, 359; Stat 301.

Agronomy Option. In addition to the Core Courses, students must complete all of the following: ADVS 111; Bot 560; Chem 111, 141, 142, 144; Ent 539; Math 105; Phys 120; Phys 270, 428, 430, 432, 520, 521, 555, 570; Soils 400, 470, 555, 556.

Biotechnology/Research Option. Complete all of the following courses and choose 20 credits from the Agronomy Option. Courses for this major must include a minimum of 30 credits from the Plants, Soils, and Biometeorology Department. Biol 319, 521; Chem 121, 122, 124, 160, 331, 332, 334, 370, 371; Math 220, 221; Micrb 301; either Phys 111 and 112, or Phys 221 and 222; PlSci 317.

Horticulture Major

Core Courses. Biol 125, 126, 386; Bot 440, 560; Chem 111 or 121; ASTE 309 or BIS 340 or CS 150; Ent 539; Math 105; PlSci 100, 110; PlSci 225 or 425; PlSci 265, 270, 316; PSB 105, 489; Soils 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; PlSci 250, 317, 360, 440*; PlSci 445* or 450*; PlSci 476, 520*, 521, 555*, 560, 565*, 570, any ornamental horticulture course*.

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, 495; PlSci 220 or 565; PlSci 440 or 445 or 450; PlSci 260, 261, 340, 360, 420.

**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; PlSci 237, 260*, 261*, 305, 310, 317, 320, 330, 340, 360, 440*; PlSci 445* or 450*; PlSci 420, 520*, 521, 555*, 560, 565*.

**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, 331, 332, 370; Math 106, 215*; Phys 120*; PlSci 317, 440*, PlSci 445* or 450*; PlSci 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 331 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 Phys 111, 112, 113, or Phys 221, 222, 223; Stat 301; PSB 489; Soils 200, 358, 359, 400, 505, 513, 565, 566.

Soil Option. In addition to the Core Courses, select 30 credits from the following: BIE 518; Binet 525; Bot 440; CEE 568, 573, 580; Chem 160; Geog 575, 593; Geol 305, 310, 350, 360, 540; Math 221; PlSci 476; Soils 470, 527, 530, 531, 555, 556.

Water Option. In addition to the Core Courses, select 30 credits from the following: ASTE 526, 555; BIE 310; Binet 200, 382, 530; Bot 420, 440; CEE 343, 561, 573; Chem 160; FW 460, 462, 551; Geol 540, 548; Math 221; PlSci 476, 520, 521; Soils 470, 562, 566; WS 420, 475, 545.

**Soil and Water Option.** In addition to the Core Courses, select a combination of 30 credits from the Soil Option and the Water Option.

**Applied Ornamental Horticulture Program**

One-Year Certificate (40 credits required). PlSci 260 and 261 are required; 28-31 additional PlSci 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 105 or 111; Engl 200 or 201; Math 101; 3-6 credits Social Sciences/Humanities; 4-7 credits Life Sciences/Physical Sciences).

Core Courses. ASTE 344; BIS 140; PlSci 100, 110, 220, 225, 237, 240, 260, 261, 305, 310, 316, 320, 330, 340, 360, 420; PSB 105.

Approved Electives. Acctg 105; ADVS 202; Biol 125, 126; Chem 111; Engl 101; LAEP 103; Math 101; MHR 235; PlSci 290, 301, 302, 317, 440, 445, 450; Soils 200.

**Minor Requirements**

Plant Science Minor (24 credits required). The following courses are required: PlSci 358; PlSci 220 or 555; PlSci 520. Select the balance of the 24 credits from the following courses: PlSci 316, 317, 428, 430, 432, 440, 450, 560, 570, 635, 660.

Agronomy Minor (24 credits required). A minimum of 9 credits of Soil Science courses must be taken, including Soils 358. A minimum of 9 credits of Plant Science courses must be taken, including two of the following three classes: PlSci 428, 430, 432. Select the balance of the 24 credits from the following courses:
Soils 359, 400, 470, 513, 530, 555, 556, 565; PISci 220 or 555; PISci 440, 450, 520, 560, 565, 570.

Soil Science Minor (24 credits required). The following courses are required: Soils 358, 359. Select the balance of the 24 credits from the following courses: Soils 400, 470, 505, 513, 527, 530, 555, 556, 565, 566.

Ornamental Horticulture Minor (24 credits required). The following courses are required: PISci 237, 240, 260, 261. Select the balance of the 24 credits from the following courses: PISci 220, 237, 260, 261, 305, 310, 316, 317, 330, 340, 360, 420. Nine credits in the ornamental horticulture minor must be upper division courses.

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, 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,5Su) ©

110. Horticulture Seminar. Leaders from industry will speak on opportunities and problems associated with ornamental horticulture. One lecture per week. (1F)

220. Weed and Pest Control. Cultural and chemical methods for controlling weeds, insects, and diseases on horticultural crops. Two lectures, one lab. (3W)

225. Occupational Experience in Agronomy and Horticulture. Students will spend full time during the quarter for on-the-job training in agronomic or horticultural industries. Prerequisite: instructor’s consent. (1-6F,5S,5Su)

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)

250. World Crops. Understanding and appreciating the task of producing the crops to feed the world. Food production centers as related to climate, latitude, altitude, and soils. Man’s influence through breeding, irrigation, fertilizers, and pesticides. (3W)

260. Herbaceous Plant Materials. The identification, culture, and utilization of herbaceous ornamental plant materials, including annuals, perennials, ground covers, bulbs, and roses. Two-hour lecture/laboratory per week. (3F)

261. Woody Plant Materials. The identification, culture, and utilization of woody ornamental plant materials. Two-hour lecture/laboratory per week. (3Sp)

265. Identification and Selection of Plants in Production Agriculture. Identification of crop 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 principles, techniques, and practices in breeding improved varieties of crop plants. (2W)

290. Special Problems in Ornamental Horticulture. Practical problems of managing a nursery or greenhouse. (1-5F,5S,5Su—applied only) ©


302. Floral Design and Judging. Advanced floral design. Evaluating design will be emphasized. One lecture and one laboratory. Prerequisite: PISci 301 and instructor’s consent. Lab fee required. (2W)

325. 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. (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. (2W)

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)

220. Garden Center Management. Merchandising, selling techniques, advertising, and general management of a garden center. (3Sp—a) students or instructor’s consent)

230. Residential Landscapes. Functional and aesthetic relationships of plants and structures in the landscape and their installation. Prerequisites: PISci 260, 261. Two lectures, two labs. (4W)

340. Landscape Management for the Interior West. Maintenance of trees, shrubs, bushes, and vines in the landscape. Prerequisites: PISci 260, 261. Three lectures. (3F)

360. Arboriculture. The culture of trees and shrubs with emphasis on pruning. Two lectures and one laboratory. (3Sp)

420. Turfgrass Science and Culture. Characteristics and culture of grasses for different regions and uses. Two lectures, one lab per week. (3Sp)

425. Occupational Experience. On-the-job training in agronomy or horticulture. Prerequisite: instructor’s consent. (1-6F,5S,5Su)

428. Field Crops. Classification, cultural methods of commercial production and market grades of cereal, root, and oil seed crops. (4W)

430. World Cropping Systems. Overview of agricultural systems throughout the world, with special emphasis on agricultural systems of Utah. Principles of evaluating and sampling agricultural commodities. Two lectures, one lab. (3W)

432. Forage Crops. The cultivation and management of legumes and grasses used for grazing, hay production, soil improvement, and conservation. Laboratories include plant development, nutrition, and plant 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. (3W)

445. Small Fruit Culture. Principles and practices for managing small fruit plantings with emphasis on strawberies, cane berries, and grapes. Two lectures, one lab per week. Prerequisite: Biol 126. (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. (4F) ©

476. Crop Ecology. Interactions between crop plants and environment, integrating concepts of plant physiology, genetics, climatology, geology, and soil science. Two lectures. Prerequisite: Bot 440 or instructor’s consent. (3W)

530 (d630). Crop Physiology. The relationship between physiological processes and yield of crops. Light interception and canopy geometry, canopy photosynthesis and respiration, carbon partitioning, and source-sink relationships. Prerequisites: Bot 440, Math 105, or instructor’s consent. Three lectures. (3Sp)

511 (d621). Crop Physiology Laboratory. Analysis of plant physiological processes which result in plant growth and crop production. Prerequisite: PISci 520 or 620 prior to or concurrently. (2Sp)

555 (d658). Weed Science. Identification of weeds, weed problems in agriculture, and methods of control. Three lectures, one lab per week. (4Sp)
Soil Science Courses


358. General Soils. Introduction to soils as a natural resource. Chemical, physical, and biological processes related to soil formation and management. Prerequisite: Chem 111 or equivalent. (4F,Sp) ©

359. General Soils Laboratory. Practice in analysis of soils and water, including demonstrations and/or field trips. Prerequisites: Soils 358 or equivalent previously or concurrently; course in chemistry or instructor's consent. (2F,Sp)

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. (5P)

478. Irrigated Soils. Soil salinity, soil-moisture-plant relationships, water supply and quality, irrigation water measurements, soil moisture movement, irrigation methods. Prerequisite: an introductory course in soil science or instructor's consent. (4W)

505 (d605). Principles of Environmental Soil Chemistry. Chemistry of the soil matrix-soil solution interaction as related to environmental processes, emphasizing the surface chemistry and ionic equilibration relationship. Prerequisite: Soils 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. (5Sp)

527 (d627). 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: general biology, organic chemistry. (3F)

531 (d631). Soil Microbiology Laboratory. Application of soil microbiological techniques. (2F)

555 (d655). Soil and Plant Nutrition. The soil, chemical, and environmental factors that affect the mineral nutrition of plants; nutrient availability, absorption, toxicity, fertilizer management, soil amendments, and water quality. Prerequisite: Soils 358. (3W)

556 (d656). Soil and Plant Nutrition Laboratory. Procedures used in determining fertility status of soils and identifying problems affecting plant growth. Prerequisite: Soils 555 prior to or concurrently, or with instructor's consent. (2W)

565 (d665). Applied Soil Physics. Physical relations of soils to water and climatic factors. The relation of soil water content and potential to plant growth, soil water flow, heat flow, and aeriation are emphasized. (3F)

566 (d666). Applied Soil Physics Laboratory. Methods of analysis. Prerequisite: Soils 555 prior to or concurrently, or instructor's consent. (2F)

Biomecnetology 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,W,Sp,Su)

325. Aviation Weather. Discussion of weather important for pilots and those associated with air travel. (2Sp)

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)

S25 (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 ancilliary data collection to support airborne and satellite remote sensing studies in agriculture and hydrology. (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. (4W)
541 (d541). 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 (d550). 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

625 (d625). Principles of Remote Sensing and Applications in Agriculture and Hydrology. (4Sp)

630 (d630). Introduction to Meteorology. (4W)

**635. Physical Climatology. (3Sp)

640. Climate Modeling. (3Sp)

641 (d641). Synoptic Meteorology. (3W)

650 (d650). Microclimate and Biophysics of Plant Canopies. (3Sp)

*652. Introduction to Biometeorological Instrumentation. (3W)

*653. Biometeorological Instruments Laboratory. (3Sp)

655. Micrometeorology. (3W)

680. Seminar. (1W,Sp) ⊗

704. Ionospheric Physics. (3F)

Plants, Soils, and Biometeorology Courses

185. Plants, Soils, and Biometeorology Orientation. Orientation to the teaching, research, and extension programs of the department and the opportunities in the field. (1F)

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) ⊗

Graduate

689. Seminar. (1F,W,Sp)

690. Special Problems. (1-5F,W,Sp,Su) ⊗


699. Continuing Graduate Advisement. (1-12F,W,Sp,Su) ⊗

780. 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) ⊗

•Parenthetical numbers preceded by "d" indicate a dual listing; parenthetical numbers preceded by an "f" are the former course numbers.

2Descriptions 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 Life Span Learning Independent Study Division.

# Taught 1994-95.

**Taught 1995-96.
Department of Political Science

College of Humanities, Arts and Social Sciences

Head: Professor Randy T. Simmons
Office in Main 320C, 797-1306

Professors William L. Furlong, H. Preston Thomas; Professor Emeritus Claude J. Burthenshaw; Associate Professors Peter F. Galderisi, David B. Goetze, Amal Kawar, Carolyn Rhodes, Veronica Ward; Assistant Professors Roberta Q. Herzberg, 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 2.5 GPA for Political Science majors and a 3.0 GPA for Prelaw majors. Students transferring into the Political Science Department must have a USU cumulative GPA of 2.5. 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 48 credits in the field. They must include PolSc 101, 110, 210, 220, 235, and 499. PolSc 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 2.5 overall GPA are required.

Prelaw Majors. Students must have at least 48 credits in political science. They must include PolSc 110, 120, 235, 464, 471, 472, and 473 or 499. PolSc 499 should be taken 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. PolSc 101 is required as well as three courses from among PolSc 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 overall GPA in political science courses is 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 sophomore 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 average and a 3.0 average in other subjects. Carolyn Rhodes is the adviser.
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 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)

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. (5F)

SS 210. Introduction to International Politics. Analysis of the national-state system as well as interdependence of the global community. (5W, 5Sp)

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. (5F, W, Sp)

235. Introduction to Political Theory. A survey course covering ancient and modern political theory. (4F)

260. Introduction to Public Administration. Presents basic theories, concepts, approaches, and analysis of current practices and problems in governmental administration. (4)

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. (3W)

311. Parties and Elections. Political parties, campaigns, and elections. (4F)

313. U.S. Legislative Politics. A simulation of the legislative process in the U.S. Congress. (5Sp)

314. The Presidency. The systematic study of the American 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. (4W)

321. Western European Government and Politics. Britain, France, Germany, Italy, and Scandinavia. (5W)

322. Political Violence and Revolution. Study and analysis of political violence from state coercion, terrorism, and coup d'etat to revolution. (4Sp)

323. Middle Eastern Government and Politics. General overview of political cultures and political developments in the Middle East. (4F)

327. Government and Politics of Mexico, Cuba, and Central America. Study and analysis of revolutions and evolution toward democratic and/or military rule. (4F)

328. Government and Politics of South America. Study and analysis of the evolution of politics from authoritarian regimes to democracy and back. (4F)

331. American Political Thought. The history of American political thought from its European antecedents to the present. (4W)

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. (3W)

380. Introduction to Public Policy. Examines different approaches to the study of public policy and different value dimensions in the design of policies. (3Sp)

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. (4Sp)

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. (4Sp)

432. History of Political Thought I. Issues and thinkers in ancient and medieval political thought. (4W)

433. History of Political Thought II. Issues and thinkers in contemporary political thought. (4Sp)

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. (3Sp)

442. National Security and Global Politics. Focus on the history and analysis of nuclear doctrine as a mechanism for the management and control of conflict in the international arena. (3Sp)

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. (3)

447. American Foreign Policy in the Pacific. An analysis of the contemporary foreign policies of the major countries surrounding the North Pacific. (5)
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. (4Sp)


454. Election Campaigns. Introduction to the many components of organizing, conducting, and financing a campaign, including campaign strategy, candidate recruitment, polling, advertising, and press releases. (4Sp)

464. Administrative Law. Legal control of administrative agencies. (3Sp)

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. (5W)

478. United States and the European Community. The study of diplomatic relations between Europe and the U.S. from the American War of Independence to the present. (3W)

489. Special Topics in Political Science. Credit arranged. Prerequisite: instructor’s consent. (1-5F;W,Sp) @

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. (4)

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)

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

601. Scope and Methods in Political Science. (4W)

603. Political Theory, Political Economy, and Capitalism. (4F)

604. Public Choice. (4F)

610. Politics and Public Policy. (4W)

612. Bureaucracy and Representative 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. (4W)

627. Comparative Political Change/Development. (4F)

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) ©

1Descriptions 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 Life Span Learning Independent Study Division.

Department of Psychology

College of Education

Head: Professor Michael R. Bertoch

Office in Emma Eccles Jones Education 487E, 797-1460

Professors Glendon W. Casto, Keith T. Checketts, Carl D. Cheney, John R. Cragun, Richley H. Crapo, Marvin G. Fifield, Cecelia H. Foxley, J. Grayson Osborne, Charles L. Salzberg, Sebastian Striefel, Karl R. White, Blaine R. Worthen; Professors Emeritus Arden N. Frandsen, Richard B. Powers, David R. Stone, E. Wayne Wright; Associate Professors Frank R. Ascione, Tamara J. Ferguson, Elwin C. Nielsen, Richard N. Roberts, David M. Stein, Lani Marie Van Dusen; Associate Professor Emeritus William R. Dobson; Assistant Professors Carolyn G. Barcus, Susan L. Crowley, Xitao Fan, Kenneth W. Merrell; Research Assistant Professor Mark S. Innocenti; Assistant Professor Emeritus J. Whorton Allen; Adjunct and Clinical Faculty J.

Degrees offered: Bachelor of Science (BS), Bachelor of Arts (BA), Master of Science (MS), 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 487B.

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.

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.

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, 342, 346, 350, 351, 380, 421, 510, and 550. Approved Psychology elective courses are: Psy 110 or 210, 121, 321, 345, 366, 372, 440, 520, and 533. 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.

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, School Psychology, and Counseling Psychology at the MS level. See the graduate catalog for further information.

Psychology Courses

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. (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. (3F,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. (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)


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)

216. Human Development: Adolescence. Characteristics of adolescents and their psychological, educational, and adjustment problems are discussed in detail. Prerequisite: Psy 101. (3F,W,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. (1-3F,W,Sp,Su)

308. 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) 1,3
321. Abnormal Psychology. A descriptive and explanatory study of the varieties of psychoses, psychosexuals, and minor maladjustments—their causes, methods of treatment, and approaches used in preventing psychological maladjustments. Prerequisite: Psy 101. (3F,Sp) 

342. 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. (3Sp) 

345. Perception and Psychophysics. Analysis of sensory-determined behavior and the methods, findings, and principles of sensory communication. Prerequisites: Psy 101. (3Sp) 

346. 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: Phys 130 or equivalent, Psy 140. (3Pl) 

350. Scientific Thinking and Methods in Psychology. Overview of scientific thinking and research methods used in Psychology and other closely related social sciences. (3W) 

351. 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,Sp,Su) 

366. Educational Psychology for Teachers. Principles and practices for development of conditions for effective learning. Prerequisites: Psy 101, and Psy 110 or 210. (3F,Sp,Su) 

372. Behavior Modification. Approaches to behavior modification in a variety of settings. An individual project is required of the student. Prerequisite: Psy 101. (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,Sp,Su) 

392. Practicum. Field work in applied psychological settings at the BS level. (1-3) 

411. Personality Theory. An expository study of various personality theories, their origin, and approaches to the understanding of human behavior. Prerequisite: Psy 101. (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. (1-6) 

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) 

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. (1-6) 

508 (660F). 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 (6610). 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) 

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) 

524. Workshop in Guidance. Designed for undergraduate or graduate level students. Serves as an overview of the varied skills needed by counselors in different settings. (1-6) 

533 (6653). Psychometrics. Evaluation, interpretation, and uses of tests of intelligence, aptitudes, interest, personality, and adjustment. Prerequisites: Psy 101, 380. (5F,Sp) 

559. (6659). Interdisciplinary Workshop, (1-3) 

590. Independent Study. Individual discussion and intensive study of a particular problem or area. Prerequisite: instructor's consent. (1-3F,Sp,Su) 

591. Independent Research. Experiments and demonstration projects are conducted and reported. Prerequisite: instructor's consent. (1-3F,Sp,Su) 

593. Instructional Apprenticeship. Training and practical experience in applying the techniques of contingency management to teaching. Prerequisite: instructor's consent. (1-3F,Sp,Su) 

Graduate 


605 (6505). Psychological Aspects of Sports Performance. (3Sp) 

606. Human Development: Adult. (3) 

610 (6510). History and Systems of Psychology. (4Sp) 

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 instructor's consent. (3F,Sp) 

621. Vocational Guidance Workshop. (1) 

622. Group Counseling and Psychotherapy: Theory and Practice. Prerequisites: Psy 650 and 635. (3) 

623. Theories of Personality and Psychotherapy. (3) 

624. Workshop in Guidance. (1-6) 

625. Graduate Cooperative Work Experience. (1-15F,Sp,Su) 

662. Career Development: Theory and Practice. (3W) 

629. Nonstereotypic Approaches to Counseling. Prerequisites: Psy 533/633, 620, 635 or consent of Instructor. (3) 

630. Group Testing. Prerequisite: Psy 533/633 and instructor's consent. (3) 

631. Intellectual Assessment. Prerequisite: Psy 533/633 and instructor's consent. (3) 

632. Psychological Assessment of Personality and Mood/Affect. (3Sp) 

633 (6533). Psychometrics. Prerequisites: Psy 101, 380. (5F) 

634. Consultation and Group Processes: Intervention at the Systems Level. (3P) 

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. Instructor's consent required for 635. (3) 

641. Psychoeducational Assessment. (3) 

646. Professional Issues in School Counseling and School Psychology. (3Su) 

650 (6550). Interdisciplinary Workshop. (1-3) 

654. Moral Development in the Family. (3) 

660. Correlation and Regression in Psychology and Education. Prerequisite: Psy 380. (3W,Sp) 

661. Inferential Statistics in Psychology and Education. Prerequisite: Psy 380. (3F,Sp)
666. Principles of Learning. (3)
667. Introduction to Educational and Psychological Research. Prerequisite: Psy 380. (3F, W, Sp, Su)
681. Seminar. (1–3) ©
685. Research Seminar. (2)
688. Transcultural Assessment and Diagnosis. (1)
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) ©
695. School Psychology Internship. (3F, W, Sp)
702. Alternative Evaluation Methodologies. Prerequisite Psy/Educ 601. (3)
703. Data Collection Techniques in Evaluation of Programs in Education and Psychology. Prerequisite Psy/Educ 601. (3)
705. Internship in Program Evaluation. (1–6F, W, Sp, Su)
706. Internship in Research. (1–6)
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. (CSSp)
725. Professional Ethics and Standards. (3F)
727 (627). Psychopathology I. Prerequisite: instructor’s consent. (3W)©
728 (628). Psychopathology II. Prerequisite: Psy 727. (3Sp)©
**732. Advanced Psychological Assessment. Prerequisite: Psy 632. (3Sp)©
735. Practicum in School Psychology. Prerequisite: permission of program chair. (3F, W, Sp, Su)©
736. Practicum in Counseling Psychology. (3F, W, Sp, Su)©
737. Practicum in Clinical Psychology. (3F, W, Sp, Su)©
747. Practicum Supervision. (1–3F, Sp)©
750. Interdisciplinary Workshop. (1–3Sp) ©
756. Designing Educational and Psychological Research. Prerequisites: Edu/Psy 660, 661, 667. (3Sp, Su)
770 (670). Grantsmanship in Education and Psychology. (3–5W)©
781. Seminar. (1–3) ©
**782. Neuropsychological Assessment Workshop. Prerequisite: Psy 632. (3)©
784. Psychopharmacology. Prerequisite: Psy 632. (3)©
795. Internship. (1–6F, W, Sp, Su) ©

*This course is also offered by COM-NET through Life Span Learning Programs.
*Taught by COM-NET 1994-95.
Parenthetical numbers preceded by ‡ indicate a dual listing; parenthetical numbers preceded by an † are the former course numbers.
*Descriptions for courses in the 600 and 700 series can be found in the graduate catalog.
*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 Life Span Learning Independent Study Division.
*Taught 1994-95.
**Taught 1995-96.

Department of Range Science

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, Philip J. Urness, Neil E. West, John P. Workman; Adjunct Professor Douglas A. Johnson; Professors Emeritus Thadis W. Box, Don D. Dwyer; Associate Professors Roger E. Banner, Christopher A. Call, James P. Dobrowski, Brien E. Norton; Adjunct Associate Professors James A. Pfister, Michael H. Ralphs; Extension Associate Professor Charles W. Gay (Assistant to the Dean for Administrative Affairs); Assistant Professors D. Layne Coppock, George Allen Rasmussen, Eugene W. Schupp; Research Assistant Professor Gregory K. Perrier; Adjunct Assistant Professors Dale L. Bartos, Thomas A. Jones; 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 Range Science are the same as those described for the University on pages 8-11. Students in good standing may apply for admission to the department.

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 Range Science courses include RS 199, 291, 300, 386, 443, 491, 541, 561, 563, 565, and 570. Students in the Management Option must complete a six-week Natural Resources summer camp (RS 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). RS 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 advisor.

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 management. See the graduate catalog for requirements and further information.

Range Science Courses

Natural Resources courses 101 through 645 are listed under the College of Natural Resources, page 52.

199. Range Science Orientation Seminar. Orientation to the profession of Range Science and Management and the Range Science 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. (3Sp,3Su)

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,3Sp)

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. Prerequisites: Biol 125, 126, 127, or permission of instructor. (4F,4W)

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,5W,5Sp,5Su)

445. Grassland and Desert Range Plants. Identification, ecology, and use of range plants of deserts and grasslands of North America. Lab fee. Prerequisites: RS 300, 386; Bot 420. (3Sp)

490. Readings and Conference. (1-6F,W,5Sp,5Su) ©

491. Range Issues Seminar. Supervised discussion and review of range resource topics. Prerequisite: Range Science graduating senior. (2F)

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,5Sp,5Su)

493. Range Problems. Individual study and research upon selected problems in range science and related subjects. Prerequisite: faculty approval. (1-3F,W,5Sp,5Su) ©


507 (6607). 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: RS 300, 386. (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: RS 300, 386, 510. (3F)

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: RS 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: RS 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: RS 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: RS 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: RS 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: RS 300, 356; 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, RS 300, NR 380. (3P)

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 RS 563 or equivalent. (3P)

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: RS 563, 565; College of Natural Resources summer camp; and range science graduating senior. (SSp)

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

600. Management of Rangelands for Grazing. Prerequisite: RS 300. (4W)

607 (d507). Range Wildlife Relations. Prerequisite: RS 300. (4W)

615. Stress Physiology of Rangeland Plants. Prerequisite: Bot 440 or equivalent. (4Sp)

**642. Vegetation Analysis. Prerequisites: RS 541 or equivalent, Stat 301 and 502, CS 241. (4Sp)

655. Syneology. Prerequisite: introductory ecology and soils. (3W)

680. Seminar. (1F,W,Sp) 

681 (d590). 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 (d665). Plant-Herbivore Interactions. (4W)

715. (d610). Physiological Ecology of Plants. (4P)

721 (d621). Physiological Ecology of Plants Practicum. (2)

730 (d630). Population Ecology of Plants. (3W)

731. Developing Careers in Research. (2W)

**742 (d641). Vegetation Classification/Ordination. (3Sp)

*765 (d665). Range Economic Analysis. Prerequisite: RS 565. (2W)

775 (d675). Range Animal Nutrition. (3P)

776. Techniques in Range Animal Nutrition Research. (2F)

797. Dissertation Research. (1-15) 

799. Continuing Graduate Advisement. (1-3) 

1Parenthetical numbers preceded by d indicate a dual listing; parenthetical numbers preceded by an f indicate the former course numbers.

2Descriptions for courses in the 600 and 700 series can be found in the graduate catalog.

*Taught 1994-95.

**Taught 1995-96.

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: To be appointed

Office in Emma Eccles Jones Education 330, 797-2222

Professors James S. Cangelosi, Michael W. Heikkinen, Izar A. Martinez, Walter L. Saunders, James P. Shaver, William J. Strong; Professors Emeritus Ross R. Allen, Eldon M. Drake, Kenneth C. Farrer; Associate Professors Varnell A. Bench, Kay Camperell, Richard S. Knight; Assistant Professor Dalphia R. Pierce; Senior Lecturer Ronald K. Drickey; 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; the Secondary Education Department 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 (2.5 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 7-12).

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 as indicated 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.


For a listing of course requirements for majors, minors, and composites see the USU Secondary Teacher Education Program Undergraduate Planning Guide available at the USU Bookstore.

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, Home Economics 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 in Emma Eccles Jones Education 103 or 330.

Professional Education Component. Students must complete the following courses: SecEd 201, 301, 302, 404, 450, 460, 510; Psy 366; Sp Ed 301; and Ins T 445, 447. Students in Agricultural Education, Art Education, Business Education, Marketing Education, Home Economics, Industrial Technology and Education, and Physical and Health Education meet the requirements for SecEd 201, 450, and 460 in different ways. These students should consult with their advisers. Students must also complete Special Teaching Methods courses in the major, as well as 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. SecEd 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.

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. To receive a State of Utah Teaching Certificate, the student must apply at the Teacher Certification Office, Emma Eccles Jones Education 103, during the last quarter of his or her teacher education program. State law requires that, as part of the application process, the applicant must consent to a background check by the Utah State Office of Education.

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 the Secondary Education Department 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)


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,So)

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: SecEd 301 and Psy 366. (4F, W,Sp)

320. Teaching English. Considers the content of the English curriculum, effective methods, and significant trends. Prerequisites: SecEd 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: SecEd 301, 335 and Psy 366. (4F, W)

335 (6335). 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: SecEd 301 and Psy 366 or permission of instructor. (3F, W,Sp,So)

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 SecEd 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. (3-6F, 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. (3F, W, Sp)

590 (6800). Managing Student Behavior. Theory and application of basic principles for responsible student behavior in school. (3W, Su)

510 (6909). 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: SecEd 301 and Psy 366. (4F, W, Sp, Su)

535 (6335). 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**

600 (6500). Managing Student Behavior. (3)

604. Measurement and Evaluation in Education. (3W, Su)

606. Human Development: Adult. (3)

609 (6510). Content Area Reading/Writing. (4F, W, Sp, Su)

610. Remedial and Developmental Reading in Secondary Schools. (3)

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 (5338). Values Education. (3)

640. Science Curriculum and Instruction. (3)

644. Creative Education. (See El Ed 644.) (3W, Su)

645. Mathematics Curriculum and Instruction. (3)

646. Education of the Gifted and Talented. (See El Ed 646.) (3)

647. Identification and Evaluation in Gifted Education. (See El Ed 647.) (3)

648. Materials and Methods in Gifted Education. (See El Ed 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)
Department of Sociology, Social Work and Anthropology

College of Humanities, Arts and Social Sciences

Head: Professor Michael B. Toney
Assistant Head: Professor Richard S. Krannich
Office in Main 224, 797-1230

Professors Richley H. Crapo, Gary H. Kiger, Yun Kim, Ann Leffler, Ronald L. Little, Jon R. Moris, Bradley W. Parlin, Brian L. Pitcher, David L. Rogers, William F. Stinner; Professors Emeritus Wade H. Andrews, Therel R. Black, H. Bruce Bylund, William A. DeHart, Gordon N. Keller, Evelyn Hodges Lewis, Wesley T. Maughan, Alison C. Thorne; Associate Professors E. Helen Berry, H. Reed Geertsen, David F. Lancy, Carol J. Loveland, Gary E. Madsen, Pamela J. Riley, Steven R. Simms; Assistant Professors Marcia D. Calloway, Susan E. Dawson, Bonnie Glass-Coffin, Derek T. Mason; Adjunct Assistant Professors Nazih Al-Rashid, Dale J. Blahna, Joanna Endter-Wada, Sue H. Guenter-Schlesinger, Don C. Larson, Janet L. Osborne, Bryan Spykerman; Research Assistant Professor William B. Fawcett; Assistant Professor Emeritus Alice C. Smith; Temporary Assistant Professor Anita M. Gander

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; 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 Sociology and 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 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 then 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. A 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, unless they have already accumulated 90 or more credits upon entering the program.

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.

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, 301, 311, and 415.

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 three of the four different 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, 240 (or SW 240), 275, 341, 342, 343, 442, 443, 475, 480; SW 365; Anthr 461.


   1These courses are highly recommended as each gives an overview of the general subject area.

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; PolSci 120, 464, 471, 472; SW 240, 300, 535; Soc 140, 341, 342, 343, 442, 443. 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 diploma and transcript will reflect the Law and Society Area Studies emphasis upon completion of requirements for a degree.

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.

A certificate is awarded upon completion of the following required courses: Soc 475; HE P 545; FHD 420 and 490; plus suggested courses, including Soc 275, 333, and FHD 301. Upon consultation with the gerontology director, optional coursework in other areas may be substituted for some of the preceding courses. Students from any major are welcome to apply for this certification program. All credits within this program apply toward the overall total required for graduation from Utah State University.

More information concerning the gerontology certification program may be obtained from the department.

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 Science 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. (3F,W,S) ©

SS 102. American Culture. Basic beliefs, values, customs, and institutions of America. (3F,S)


160. Rural Sociology. Patterns of settlement and their influence upon rural life. Rural institutions and adjustments to meet rural problems. (3F)

IO 328. Gender Roles in American Society. An examination of the socialization of males and females for their expected roles in American society. (3F,W,S)

240. Social Welfare and Minority Groups. Examines social and cultural characteristics of various minority groups and emphasizes the role 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)

301. Contemporary Sociological Theory. This course examines crucial issues and theories of contemporary sociology and looks at how earlier theorists and more contemporary theorists have dealt with these issues and concepts. (3W)

311. Methods of Social Research. Methods and techniques of analyzing and interpreting social data. (3F,W)

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)

415. Social Statistics I. Levels of measurement; measure of central tendency, dispersion and association; probability, the normal curve, statistical inference. (3F,W,S)

420. World Population Problems. Current and future population problems, particularly in less developed areas of the world. Factors affecting population growth and change. (3)


435. 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 civil and criminal law to power, morality, interest groups, social control, and social change. (3)

446 (4461). 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 (4665). 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 (4773). Women in International Development. Focuses on status of women in developing countries and the role they play in the development process. (3)

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,S) ©

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. (1-3F,W,S,Su) ©

497E. 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 482E. (1-9F,W,S,Su)

Graduate

601. Development of Sociological Theory. (3)

602. Advanced Sociological Theory. Prerequisite: Soc 301. (3)

603. Theory Construction in Sociology. (3)

610. Advanced Methods of Social Research. (3)
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
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 Basic Core Curriculum 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. Overall University requirements for graduation. In addition, Social Work majors are specifically required to take Biology LS 101, Biology and the Citizen, as part of their Life Science General Education Quadrant.
   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, a grade point average of 2.5 must be maintained in courses required for the major. Students must also maintain a 2.5 overall GPA.
      a. Complete the Basic Core Curriculum: SW 105, 227, 240, 250; FHD 150; Anthr 101; Engl 101 or 111; Engl 201; Biol LS 101. The Basic Core Curriculum is designed to introduce the student to fundamental knowledge in social work. This includes field observation, research skills, minority issues, and a basic understanding of human behavior in the social environment.
   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 with a grade of C+ or higher, and must have completed SW 415, 416, and 417 with a grade of C or higher. Advanced 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).
   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.

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, 305, 335, 336, 365, 375, 410, 485, 535, 590, and 595.

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.

By careful planning, a social work major preferring to do so can complete requirements for a secondary or elementary teaching certificate.

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. (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)

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. (3W)

385. Social Work Practice. An introduction to social work practice; the generalist approach, helping process, values and ethics, skills and assessment. Prerequisites: SW 105, 227, 240, 250. (3F)

335. Child Welfare. Developments in programs for meeting such needs of children as substitute parental care, adoption, delinquency problems, mental retardation, and unmarried motherhood. (3F) ©

336. Social Work With Adolescents. Theory and technique of working with delinquent and troubled youth using the social work perspective. (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. (3W)
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.


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 415, Social Statistics 1 (3 credits), or Stat 301 and 302, 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: Anthr 101 or 150 (5 credits) and Anthr 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. (3)

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 cultural 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)


396. History of Cultural Anthropology. An introduction to the major and contemporary theorists who have shaped cultural anthropological thought. (3F)

IO 340. An Introduction to Linguistics. Theory of language and survey of structural and generative phonology, morphology, syntax; language acquisition; second language learning. (See L 340L) (2)


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)

400 (d600). Anthropological Theory. The intellectual history and development of alternate theoretical perspectives in anthropology. (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). 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)

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 life way examined from prehistoric to modern times and cross-culturally. (3)

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)


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). Prehistory of Utah and the Great Basin. Ecological perspective on the prehistory of Utah and surrounding states from initial human occupation to historic contact. Three credits lecture, five credits lecture/field trips. (3-5)


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)

501. Senior Seminar. A seminar emphasizing research and writing skills in selected topics in anthropology. (3)

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)

596. Independent Studies. Specialized training for advanced students based on an approved proposal. (1-5) ©

Graduate

600 (d400). Anthropological Theory. (3)

604 (d404). Peoples of Latin America. (3W)

607 (d407). Anthropology of Sex and Gender. (3)

609 (d409). Medical Anthropology. (3)

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). Prehistory of Utah and the Great Basin. (3-5)

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)
611 (4461). Psychological Anthropology. (3)

669. Themes in Folklore. (3)

673. Studies in Folklife. (3) ∞

680 (4480). Seminar: Topics in Anthropology. (3-5) ∞

690. Independent Studies. (1-5) ∞

Department of
Special Education
College of Education

Head: Professor Charles L. Salzberg
Office in Emma Eccles Jones Education 313A, 797-3243

Professors Garth M. Eldredge, Marvin G. Fifield, Alan M. Hofmeister, Glenn I. Latham, Richard P. West, Karl R. White, K. Richard Young; Associate Professors Martin Agran, Benjamin Lignugaris/Kraft, Daniel P. Morgan, Sarah Rule; Associate Professors Emeritus Hyrum S. Henderson, Devoe C. Rickert; Assistant Professors Pamela J. Hudson, Timothy A. Slocum; Clinical Assistant Professor Julie F. Smart; Research Assistant Professor Robert L. Morgan; Clinical Instructors Barbara J. Flecht, Joan F. Forsgren-White

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 Department participates in the Interdepartmental Doctor of Education (EdD)

Areas of Specialization: The Department of Special Education offers training programs for individuals desiring 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 disabilities 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 elementary endorsement.

Objectives

The Department of Special Education 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. Courses are open to all students who have the necessary prerequisites. Additionally, 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 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, Sp Ed 215, and Sp Ed 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. Freshmen and sophomores considering special education as a major should take Sp Ed 215 for early practicum experience and Sp Ed 301 for an introduction to 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 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 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. (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. (3F)

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. (3F)

504. Foundations of Effective Instructional Procedures. Provides prospective special education teachers with effective instructional approaches to help students achieve mastery and proficiency in learning. (3F)

505. Applied Behavior Analysis in Education. Students will learn to effectively apply principles of behavior management and instruction of children and youth. (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. (3Sp)

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. (3W)

508. Remediation 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. (3Sp)

520. Student Teaching in Special Education. (3-15F,W,Sp, Su)

532. Curriculum for Students with Mild/Moderate Disabilities. Students learn basic skills curricula and develop skills in assessing and teaching math, reading, and writing skills for students with mild/moderate disabilities. (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. (3Sp)

540. Practicum: Direct Instruction Reading, Math, and Language. Students teach academic skills to pupils with mild or moderate disabilities daily using direct instruction techniques. Prerequisite: permission of instructor. (1-4F, W) ↘

541. Practicum: Individualized Instruction in Reading and Mathematics. Students will learn to teach students with mild/moderate disabilities in reading and arithmetic so that each progresses as fast as his/her capabilities allow. Prerequisite: permission of instructor. (1-4F, W) ↘

542. Practicum: Eligibility Assessment. Students will conduct assessments of school-aged pupils suspected of having mild or moderate disabilities according to state guidelines. Prerequisite: permission of instructor. (1-2Sp)

543. Practicum: Teacher Designed Instruction. Students assess, design teaching materials, and provide daily instruction to pupils with mild or moderate disabilities. Prerequisites: Sp Ed 540 and 541 and 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. (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 programs. (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. (3W)

558. Issues in Educating Persons with Severe Disabilities. A seminar to discuss current topics and research trends affecting persons with severe disabilities. (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: permission of instructor. (1-4F, W) ↘

562. Practicum: Systematic Instruction of Students with Severe Disabilities. Provides an opportunity to assess a student and to select a program to teach, revising it as necessary. Prerequisite: permission of instructor. (1-4F, W, Sp) ↘

563. Practicum: Advanced Systematic Instruction of Students with Severe Disabilities. Provides the opportunity to assess a need, design a program with goals and objectives, and revise the instruction to teach another to implement the programs. Prerequisite: permission of instructor. (1-4F, W, Sp) ↘
574 (d626). 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. (3Sp)

575 (d675). Educating Autistic Children. The basic knowledge and skills needed to teach autistic children will be discussed. The course will cover etiology, assessment procedures, intervention strategies, and learning characteristics. (3F, Su)

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. (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. (4W)

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. (3)

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. (4W)

585 (d685). Vocational Evaluation Principles and Systems. Introduces the student 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. (3)

586. Practicum with Infants and Families. Discusses topics relating to service delivery for infants and their families. Experience in serving families in the home. (4Sp)

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*

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. (3)

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, Sp)

611. Psychosocial Aspects of Disability. (3W)

612. Medical Aspects of Disability, Part A. (3W)

613. Vocational Counseling. (3Sp)

615. Case Studies in Rehabilitation. (3Su)

616. Medical Aspects of Disability, Part B. (3Sp)
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) ®

*Parenthetical numbers preceded by ‘d’ indicate a dual listing.
*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 Life Span Learning 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 232, 797-3046

Professor Colin B. Johnson; Professor Emeritus W. Vosco Call; Associate Professors Lynda Linford, Arthur Y. Smith; Assistant Professors Kevin Doyle, Bruce L. Duerden, Roger Held, Nancy E. Hills, 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 232.

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 2.2 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: ThArt 100, 105, 109, 121, 150, 205, 246, and 430 or 432. Students must also complete the Production Practicum (ThArt 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): ThArt 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): ThArt 100 (1 credit); performance courses (10 credits); design-technical courses (10 credits); dramatic literature (9 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, special 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. (3F, 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)


172. Mime and Movement for Theatre I. Practice in movement fundamentals for realistic theatre mimics. 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 a chronological survey of tragedy, comedy, melodrama, and farce in both classical and romantic modes of understanding. Prerequisite: ThArt 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. (2F, W)

211. Intermediate Acting. A skills acquiring course based on organic acting techniques. Can be repeated for 4 credits with permission of instructor. Prerequisite: ThArt 121. (2F, W)

246. Fundamentals of Directing. Study and use of composition, picturization, movement, rhythm, gesture, etc. (3Sp)

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: ThArt 150. (3F)

252. Historic Costume for the Stage II. Continuation of ThArt 251. Historical survey of costumes from 1700 to present with emphasis on reproduction for the stage. Survey of manners and movement in costumes. Prerequisite: ThArt 150. (3W)

254. Stage Lighting. Lighting design, instrument placement, and control board operation. Prerequisite: ThArt 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: ThArt 172. (1Sp)

292. Production Practicum. Specialized work in technical practice in ongoing Theatre Arts Department productions. Prerequisite: permission of instructor. (1F, W, Sp)


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: ThArt 209. (3)

350. Scenery Painting for the Theatre. Advanced work in theory, techniques, and practice in scenery painting for the theatre. Prerequisite: ThArt 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 ceremonies, 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 Elizabethan stage to the modern period. (3F)

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 SecEd 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: ThArt 246. (2W, 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: ThArt 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: ThArt 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 (6610).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)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>618</td>
<td>Storytelling</td>
<td>Techniques of traditional storytelling; collecting stories appropriate for periods in the child's and young adult's development. (SF,W,Sp,Su)</td>
</tr>
<tr>
<td>619</td>
<td>Tales and Telling</td>
<td>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. (SF,W,Sp,Su)</td>
</tr>
<tr>
<td>620</td>
<td>Voice Methods</td>
<td>Advanced work in voice that continues the training of ThArt 109 and 209. Also an introduction to various voice methodologies. (3Sp)</td>
</tr>
<tr>
<td>621</td>
<td>Advanced Acting</td>
<td>Analysis and creating of roles with emphasis on classic characterizations, traditional acting methods and styles. Prerequisites: ThArt 221, 316, 372, or equivalencies. Repeatable for up to 8 credits. (2)</td>
</tr>
<tr>
<td>622</td>
<td>Poetry Appreciation</td>
<td>Oral reading principles and positive strategies for introducing poetry to young people. (SF,W,Sp,Su)</td>
</tr>
<tr>
<td>630</td>
<td>Oral Interpretation Workshop of Children's Literature</td>
<td>Theory and practice of oral reading principles for various forms of children's literature; emphasis on choral reading, play reading, and readers theatre. (SF,W,Sp,Su)</td>
</tr>
<tr>
<td>634</td>
<td>Modern Continental Drama</td>
<td>(3)</td>
</tr>
<tr>
<td>636</td>
<td>Contemporary Theatre</td>
<td>Theatre from WW II to the present day, reviewing the major movements in experimentalism in literature and production from the late 19th century. (3Sp)</td>
</tr>
<tr>
<td>649</td>
<td>Modern American Drama</td>
<td>(3)</td>
</tr>
<tr>
<td>650</td>
<td>Period Styles, Architecture, and Decoration for the Stage</td>
<td>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: ThArt 150. (3W)</td>
</tr>
<tr>
<td>651</td>
<td>Advanced Scene Design</td>
<td>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: ThArt 150, 450, and 550. (3Sp)</td>
</tr>
<tr>
<td>652</td>
<td>Costume Construction Lab</td>
<td>Individualized practical laboratory experience in pattern drafting, cutting, fitting, construction, and decoration of costumes for theatre productions. (2F,W,Sp,Su)</td>
</tr>
<tr>
<td>660</td>
<td>Theatre Organization and Management</td>
<td>Managerial aspects of educational and community theatres: objectives, staff, facilities, schedules, promotion, budgets, financial support, etc. Taught on demand. (2Sp)</td>
</tr>
<tr>
<td>661</td>
<td>Repertory Theatre Production</td>
<td>Rehearsals, crew and staff assignments. Performance members selected through audition and based on ability and commitment to theatre. Enrollment limited and by permission of the Theatre Arts Department staff. (3-12Su)</td>
</tr>
<tr>
<td>668</td>
<td>Dramatic Theory and Criticism</td>
<td>Explores the traditional works of critical theory that relate to the theatrical arts beginning with Aristotle's Poetics. (3W)</td>
</tr>
<tr>
<td>670</td>
<td>Seminar in Drama</td>
<td>(1-5)</td>
</tr>
<tr>
<td>671</td>
<td>Repertory Theatre Production</td>
<td>(3-6Su)</td>
</tr>
<tr>
<td>672</td>
<td>Dramatic Theory and Criticism</td>
<td>(3W)</td>
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<tr>
<td>673</td>
<td>Thesis</td>
<td>(1-6)</td>
</tr>
<tr>
<td>674</td>
<td>Continuing Graduate Advisement</td>
<td>(1-3)</td>
</tr>
</tbody>
</table>

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

*Taught 1994-95.
**Taught 1995-96.
Interdepartmental Program in
Watershed Science

College of Natural Resources

Director: Associate Professor Charles P. Hawkins
Office in Natural Resources 355, 797-2461

Professors Allan Falconer, John A. Kadlec; Affiliate Professors David S. Bowles, L. Douglas James; Affiliate Professor Emeritus J. Paul Riley; Associate Professors Roger E. Banner, James P. Dobrowolski, Michael J. Jenkins, Wayne A. Wurtsbaugh; Affiliate Associate Professor Christopher M. Neale; Assistant Professors Mark W. Brunson, D. Layne Coppock, Todd A. Crowl, Joanna L. Endler-Wada, Robert E. Ford, Jr., Chris Luecke, Michael P. O'Neill, R. Douglas Ramsey, G. Allen Rasmussen, John C. Schmidt, Robert H. Schmidt, Helga Van Miegroet; Research Assistant Professor Jeffrey L. Kerschner; Affiliate Assistant Professors Thomas B. Hardy, Thomas 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 Range Science 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, 386; Bimet 200 or 530; Chem 121, 122, 124, 141; Econ 200; Geog 416, 575; Geol 111, 548; Math 220, 221; Phyx 111, 112; Soils 358, 359; Stat 201; NR 101, 102, 201, 360, 370, 380, 390; WS 300, 420, 460, 475, 515; 2 courses selected from FW 300, FR 300, RR 300, and RS 300.

The following courses must be completed during the College of Natural Resources summer camp: FR 301, 302, 303; RS 298; and Geog/WS 301. The credits earned at camp do not count toward the 186 credits required for graduation.

In addition to the courses listed above, students must complete courses listed for one of the following options:

Hydrology Option. CEE 343; Geog 593; Soils 565, 566; WS 545, 549, 556.

Management Option. FR 324, 555; Geog 593; MHR 360; RS 563; WS 545.

Ecology Option. Bimet 550; FW 462; Zool 580; RS 541 or Bot 420; RS 561.

Minor in Watershed Science (21-23 credits). WS 300, 420, and 549; CEE 343; plus six to eight additional credits elected from the following courses: Geog 416; WS 460, 475, 515, 545, and 556.

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. (3F,W)


416 (0616).1 Hillside 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 in nonisolated ecosystems. Prerequisites: Chem 121, 122; Phys 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. Watershed Science Problems. Individual study and research upon selected problems in watershed science and related subjects. (1-6F,W,Sp) 

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 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. Prerequisites: 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 (649). 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)

Graduate

616 (416). 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) ®

Cooperative

Nursing Program

College of Science

Weber State University/Utah State University

Coordinator: Instructor Pamela 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 students and grants the Associate of Science degree upon the student's completion of the course. Registration takes place at 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.


2. Continuing Graduate Advisement. (1-3) ®

3. Watershed Science Dissertation. (1-15) ®

4. Continuing Graduate Advisement. (1-3) ®

*Parenthetical numbers preceded by d indicate a dual listing; parenthetical numbers preceded by an f are the former course numbers.

1. Descriptions for courses in the 600 and 700 series can be found in the graduate catalog.

Tought 1994-95.


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

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

101. Fundamentals of Nursing Care. Assists students to develop fundamental skills and identify simple nursing problems related to basic needs of people. (8F)

111. Needs of Adults. Uses nursing assessment and more advanced skills dealing with common types of pathology, diagnostic procedures, and specialized equipment to help meet basic human needs. (9W)

Health Science 114. Basic Pharmacology. (2F)

121, 123. Needs of Family. Uses nursing assessment and more advanced particular skills which help meet basic human needs of the family through the cycle of childbearing and child rearing. (10Sp)

201. Needs of Adults. (Medical Intervention) (7F)

211. Needs of Adults. (Surgical Intervention) (7W)

Health Science 214. Pharmacology. (2F)

221. Emotional Needs of People. (7Sp)

Health Science 230. Introduction to Pathophysiology. The nature of disease and its effect upon body systems. (4F)

299. Nursing Seminars. (2Sp)

(Courses 201, 211, and 221 are interrelated. Students apply known principles and plan and administer nursing care for individuals with more complex health problems, regardless of age. Students assess, plan, implement, and evaluate nursing care of patients with an alteration of their basic needs.)
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 divisions and units, 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 for Extension: Byron R. Burnham, 797-1637
Budget: 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
Public and Technical Services: Robert G. Murdoch, 797-2631
  Reference Services
  Circulation Services
  Government Documents
  Cataloging
  Acquisitions
  Serials and Binding

Special Collections and Archives: A. J. Simmonds, 797-2661
  Manuscripts
  Archives
  Rare Books and Printed Matter
  Fife Folklore Archive

Media 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: Robb Russon, 797-2655
Chief Engineer, Audio and Video Engineering: Rickey D. Hughes, 797-2706
Manager, Television Services: Kenneth E. Boutwell, 797-3139

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.

Publication Design and Production
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
Associate Director: Ray L. Rawlins, 797-2401

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 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 serve 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 Directors:**
- Ellen Schunk, 797-0023
- Scott D. Wells, 797-3336

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.

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**Summer Quarter**

**Summer Quarter Administrative Committee:**

- C. Blythe Ahlstrom, Main 118, 797-1166
- Lynn J. Poulsen, SC 246A, 797-1107
- Rex L. Tueller, LSLCC 101B, 797-2134

**1994 Schedule**

- Presession: June 6-17
- Eight-week session: June 30-August 12
- Postsession: August 15-19

**1995 Schedule**

- Presession: June 12-23
- Eight-week session: June 26-August 18
- Postsession: August 21-25

**1996 Schedule**

- Presession: June 10-21
- Eight-week session: June 24-August 16
- Postsession: August 19-23

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 early 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. 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 classwork 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 off-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 Main 130, 797-1189

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, 797-1724
Director of Housing: Gary L. Smith, 1151 East 700 North, 797-3266
Director, Office of International Students and Scholars: Afton B. Tew, SC 313, 797-1124
Director, Parking and Visitor Information: Terry K. Moore, Parking and Visitor Information, 797-3414
Director, Multicultural Affairs Center: Paul A. Jones, SC 220, 797-1733
Director, Student Publications: Jay C. Wamsley, SC 319, 797-1759
Director, Student Development: Gary A. Chambers, SC 326, 797-1724
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, 797-1747
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
Coordinator, Helpline/Information Referral: Jaynan Chancellor, SC 139A, 797-1647

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, 797-1133
Director, General Registration: LaVell E. Saunders, SC 302, 797-1128
Director, Learning and Life Skills Center: Carol G. Green, SC 302, 797-1132
Director, New Student Orientation: Chuck Lopez, SC 302, 797-3373
Director, Student Support Services:
Nazih T. Al-Rashid, SC 104, 797-3372
Director, Summer Citizens: Carol G. Green, SC 302, 797-3373
Director, Disability Resource Center: Diane C. Baum, SC 104, 797-2444
Coordinator, Athletic Eligibility: Kenneth B. Mitchell, SC 302, 797-1783

Assistant Vice President for Student Services: Lynn J. Poulsen, SC 246, 797-1107
Director of Admissions: J. Rodney Clark, SC 246, 797-1107
Registrar: Charles L. Olson, SC 246, 797-1105
Director, Financial Aid: Vicki Atkinson, 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: Elizabeth W. Allen, SC 246, 797-1112
Records Office: Elizabeth W. Allen, SC 246, 797-1116
Residency Office: J. Rodney Clark, SC 246, 797-1107
Financial Aid and Scholarship Information

Financial Aid Office
Director: Vicki Atkinson, 797-0173
Associate Director: Judy LeCheminant
Assistant Director: Richard Watkins
Assistant Director: Dallin J. Phillips
Assistant Director: Sharon B. Robinette
Assistant Director: Sylvia M. Jones
Assistant Director: Steven J. Sharp
Assistant Director, Computer Operations: Darrell M. Wilcox
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 better selection for funding and of having aid available in time to meet school needs. Some aid is available throughout the year. See the Financial Aid Office for assistance.

Scholarships are awarded to qualifying applicants who apply on or before March 1, prior to the award 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 $2,300 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 may borrow up to $1,800 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. Loans of more than $2,800 are repaid over 10 years on a repayment schedule determined by the borrower and the loan officer during the borrower's school exit interview. Awarding is based on need and funding.

Federal Stafford Loan (GSL). Low, variable interest loans made by a lender such as a bank, credit union, or savings and loan association. Stafford loans are insured by a guarantee agency, and reinsured by the federal government. 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 to the beginning of repayment is paid by the federal government for "subsidized" Federal Stafford Loans, awarded according to need. 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 by 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 (1994-95 Financial Aid Budgets)

<table>
<thead>
<tr>
<th></th>
<th>Resident</th>
<th>Nonresident</th>
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</thead>
<tbody>
<tr>
<td>Tuition and Fees</td>
<td>$1,775</td>
<td>$5,175</td>
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<tr>
<td>Room and Board</td>
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<td>4,185</td>
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<tr>
<td>Books and Supplies</td>
<td>700</td>
<td>700</td>
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<tr>
<td>Personal Expenses</td>
<td>1,460</td>
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<tr>
<td>Transportation</td>
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<tr>
<td>Totals</td>
<td>$9,150</td>
<td>$12,550</td>
</tr>
</tbody>
</table>

1 See complete schedule of tuition and fees in the Admissions and Records 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, Stafford, or SLS Loan are required to have an exit interview when withdrawing from school. See the Admissions and Records 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, Perkins Loan, or Work-Study aid. The Stafford loan requires a minimum of 6 credits quarterly to receive and protect 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 when on probation will be terminated from further aid. Upon appeal, exceptions to the above policies and procedures may be granted when a student’s circumstances warrant.

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.

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.

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. See Military Science Department for information and application. Applications can be picked up starting December 1.

Ezra Taft Benson Scholarship. For entering 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 Broadway 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盐 Lake Scholarships. Scholarships for incoming freshmen with leadership and academic qualifications. Some scholarships 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.

Laurence and Flavian Cazier Blackett Scholarships. Awarded to students who demonstrate financial need and can show personal integrity.

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 next 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.

Leo Hawks Scholarship. Recipient must be a graduate of Preston High School.

Van H. and Elaine Y. Jarrett 4-H Scholarship. Financial aid for current or former 4-H members attending USU. See 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.

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.

Native American Scholarship Fund. Established by the United Inter-Tribal Council at USU 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.

Melvin Ronald Olsen Scholarship. Recipient must be a male graduate of Snow College and must not be a member of the LDS Church.

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 student is registered for 12 or more credits. Three types of waiver scholarships are offered by USU. (1) Academic Honors at Entrance Scholarships are awarded to students showing academic excellence during high school. (2) Achievement Scholarships are awarded to incoming students with exceptional talents and selected student body officers 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 228-239.
President’s Leadership Council Scholarship. Four-year scholarships awarded to high school leaders. Pays full tuition and student body fees. For application and more information contact the Office of High School/College Relations.

Quadrange Scholarship. Applicants may receive additional scholarship or tuition waiver. Awards are available to graduates, undergraduates, international, classified dependent, and re-entry students.

Woody B. Searle Scholarship. A tuition scholarship is awarded each year by Woody 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.

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.

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 insigicuous 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.

University Club Scholarships. The University Scholarships 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 student body fees plus $1,000 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 Fonnabeck Gardner and Sharon Gardner Ellis 4-H Scholarship. Financial aid for students participating in the 4-H program. See 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.

The Wallace R. Wayman Memorial Scholarship Fund. From an endowment established by Mr. Wayman, these funds are to help needy students attending USU. The recipient is chosen by the family. Apply in the Financial Aid Office by March 1.

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.

Ex-Cell Grant. 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 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/Ex-cell 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.

Air Force ROTC Scholarship. Arranged for two to four years, this scholarship pays for tuition, fees, and books and $300 towards a room contract, plus a nontaxable allowance of $100 per month. See 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. See Dan Christiansen 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.

Eccles-Jones Scholarship. Marriner S. Eccles and Emma Eccles Jones have established a scholarship fund to assist deserving African-American and Hispanic students in achieving a college education. More information and applications are available in the Student Services Office, SC 220.

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.

The Johansen Scholarship Fund. A gift of Johanna 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, Main 130.

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. For details see Prof. Michael Heikkinen in Secondary Education Department.

Helen Lundstrom Scholarship. Given in honor of Dean Lundstrom, this aid is for an undergraduate or graduate female student with high academic standing. Apply in the Financial Aid Office by March 1.

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.
Scholarships


N. Glen Neely Scholarship. Nathan Glen and Deta P. Neely established, in their will, scholarships for worthy students. Apply in the Financial Aid Office by March 1.

Harold L. Nielsen 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.

Larin Pollard Scholarship. One scholarship given annually in memory of Larin Pollard by his parents. Recipient must be a junior or senior returned LDS missionary.

T.G. Rechow Scholarship. Unrestricted scholarships established in their will by the Rechows. Apply in the Financial Aid Office by March 1.


Sorosis Scholarship. Given to a girl during her junior year who has attended USU at least two years and displays leadership ability and shows promise of achievement in the future. 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. For 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.

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 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.

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 herdman.

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. Blingham 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. Blinn Scholarship. An endowed scholarship awarded to a junior majoring in Animal, Dairy, or Biometry Science who demonstrates academic achievement, personal integrity, and a high sense of social and moral responsibility.

Sorosis Scholarship. Given annually in memory of Larin Pollard by his parents. Recipient must be a junior or senior returned LDS missionary.

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Wayne and Lucille S. Blinn Scholarship. An endowed scholarship awarded to a junior majoring in Animal, Dairy, or Biometry 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. Blanche Memorial Fund Scholarship. This scholarship is to be given to upper division students in agricultural economics with demonstrated academic ability, financial need, and personal integrity.

J. Grant Broadstreet 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 Select Sires Award. One or more awards for students currently enrolled in the Dairy Herdsmen’s Program, based on scholarship, need, leadership, and interest in becoming a dairy herdman.

Cache Valley Cooperative Scholarship. These funds are for graduate students in dairy science, agricultural economics, and sociology involved in studies on farm cooperatives. See department head for details.

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.

CENEX Cooperative Studies Scholarships. Awards of $500 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 achievement and professional promise.

D. Kenneth 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 D. Kenneth 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.

Davis County Master Gardner 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.

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 Herf 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.

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 Land Frischknect Award. The recipients of this award should demonstrate academic achievement, financial need, and personal integrity.

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 Cordero 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 Loyal Hunter Scholarship. Awards for students majoring in agricultural economics or agribusiness. The award is based on academic performance and professional promise.

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 in 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 (5) have no other tuition waiver for the quarters this award is to be used.

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.

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 achievement 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.

Marineer 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.

John E. and Ruth M. Ogusthope Scholarship. A scholarship from an endowment fund initiated by John and Ruth Ogusthope 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.

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.

Loren D. Pollard Memorial Scholarship. Awarded to a student demonstrating quality academic achievement, superior potential, personal integrity, and a high sense of social and moral responsibility.

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 Club's Council.

Nelson Hicks Creamery Company Scholarships. Two awards of $500 each to outstanding freshmen majoring in food science with an interest in dairy processing.

Pepperidge Farm, Inc. Scholarship. One or more awards for students in food science based on scholarship and dedication to the food industry.

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.


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. See 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.

- President's Award. An award of $500 to an undergraduate student in agricultural production.
Scholarships

b. Leadership Award. An award of $500 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:

Alexander Hamilton Life Insurance Scholarship. Two $1,500 scholarships to be awarded to deserving students.

DeLoma and Margaret Anderson Scholarship. An $840 scholarship awarded to a deserving student.

AFICS 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.

Herschell K. Bullen Scholarship. An $830 scholarship to be awarded to a deserving student.

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. Larozette G. Hale. Annual scholarship awarded to a graduate or undergraduate accounting major with promising leadership potential and above average scholastic record.

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 Nan Christensen Scholarship. Two $300 scholarships to be given to College of Business students who show scholarship, integrity, and leadership.

Farmers Insurance Group. A $1,500 scholarship awarded to a deserving student for academic achievement.

First Interstate Bank Scholarship. A $1,800 scholarship based on scholastic attainment, need, and parental residence in Utah.

First Security Foundation Scholarship. A $1,752 scholarship awarded to a student of junior or senior standing who is studying banking and finance.

Russell Hanson Business Scholarship. A $200 scholarship awarded to a deserving student for academic achievement.

Floris B. Henderson Scholarship. A three-quarter tuition waiver to an incoming student in business education.

Vernon L. Israelson Scholarship. A $440 scholarship awarded to a junior or senior student majoring in economics, based on academic promise, character, and citizenship.

Seely-Hinkley 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 award to a student who has demonstrated quality academic achievement as well as social and personal integrity.

Bert L. and Barbara Palmer Thomas Scholarship. Two $1,670 scholarships awarded to outstanding upper division students.

H. Ward and Helen Rognar Thomas Scholarship. A $455 scholarship awarded to a student in business.

Timothy Rognar Thomas Scholarship. A $230 scholarship awarded to a student of junior or senior standing who is majoring in accounting.

University Club Scholarship. 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. Wanggaard Scholarship. A $754 scholarship awarded to a deserving student.

Western Association of Food Chains' Scholarship. A $1,328 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.

Grant Thornton Scholarship. A $1,000 scholarship awarded to a deserving student majoring in accounting.

Jones, Wright, Swensen & Simkins Scholarship. A $500 scholarship awarded to a student showing promise for success in the accounting profession.

Roland Monson Scholarship. A $1,086 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.

Sylvan Erickson Graduate Scholarship. A $500 scholarship awarded to a graduate student in Business Administration based on academic achievement, integrity, and character.

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, see the director of the College of Business Student Service Center (Business 306). Application forms are available from the College of Business Student Service Center.
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 Extension and Field Services, College of Education.

Oral L. and Tracy 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 Calne 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 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. See department for details.

Lois Down Scholarship. Students who have attained a high scholarship standard, maintain a high ethical standard, 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 head, Department of HPER.

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 Department. Contact head, Department of Special Education.

H. B. and Ethel Hanusker 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 the 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 who demonstrates superior academic achievement and has financial need.

Ina W. Kuzzhals Scholarship. Department of Elementary Education. Upper division and graduate students are eligible for this scholarship. Contact head, Department of Elementary 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, 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 majoring in elementary education, family and human development, and home economics. Information and applications may be obtained from these three departments.

Chloe Friday 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 Financial Aid Office.

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.

Undergraduate Special Education Major Scholarship. Department of Special Education. Upper class and special education majors are eligible to apply for this $200-300 one-time award. Contact head, Department of Special 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 inmate student enrolled in the Mechanical and Aerospace Engineering Department.

Jay R. Bingham Scholarship. Scholarships given to students majoring in Civil Engineering. Amounts vary each year.

A. Alvina and Anna Beth Roeder 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 or Mechanical and Aerospace Engineering. Recipients must be U.S. citizens and residents of Utah. Amounts vary.

Ray Burnell Memorial Fund for Engineering Students. Approximately $1,000 to be available annually to aid undergraduate engineering students. Established by the late Mrs. Burnell 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.

James A. Comstock Memorial Scholarship. Scholarships given annually to a junior or senior in electrical engineering.

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. See 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. Carden 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.

Bertha L. and Anna E. Embry Scholarship. To be used for students in biological and irrigation engineering and electrical engineering.

Forseth Associates Scholarship in Civil and Environmental Engineering. Awarded annually to an outstanding student enrolled or to be enrolled at USU.

Parker Hannifin Corporation Scholarship. A scholarship awarded to a student majoring in Mechanical 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 Scholarship. Two scholarships awarded annually: one in civil engineering and one in another department in the College of Engineering.

Kennebec Corporation Scholarship. Scholarships awarded to students in civil engineering, environmental engineering, or industrial hygiene.

William H. Kibbe Aviation Scholarship. Awarded to students in the flight technology program with demonstrated need and significant progress in the program.

LarWest Engineering Scholarship. Department of Civil and Environmental Engineering. Available to students entering their junior or senior year. Amounts vary from year to year.

Mechanical Engineering Alumni and Faculty Scholarship. Student must have a high GPA and be pursuing a degree in mechanical engineering.

Lawrence R. and Abella Meglli Scholarship. Two scholarships to be awarded annually: one in electrical engineering, one in physics. Each year at least one of the recipients shall be a woman or ethnic minority student. Preference will be given to students involved in the “Out-Away Special” program.

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, Wanggard Scholarship. An annual scholarship is given 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. Peterson 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 Bonnie C. Peterson Scholarship in Engineering. Available to students in the College of Engineering.

Harold and Eise Peterson Scholarships. 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.

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.

SME Scholarship. Student must have a high GPA and be pursuing a degree in mechanical engineering with a manufacturing option.

Carl and Nadazne Spear Scholarship. Awarded to a junior or senior student majoring in either Mechanical or Manufacturing Engineering.

Sidney R. Stock Scholarship in Electrical Engineering. This scholarship, given in memory of the founder of the department, is for students majoring in electrical engineering. See department for details.

Ivan M. and Ruth C. Teuscher Memorial Scholarship. One year’s tuition scholarships for students in the College of Engineering.

Charles Thirkell and Pearl Parkinson Darley Scholarship. Scholarship awarded to continuing students or transfer students in civil engineering. Amounts vary.

TRW Scholarship. Awarded to undergraduate students majoring in engineering.

Edwin P. Van Leuven Scholarship. To be given 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 DeLonee 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 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 1939) Family Life 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.

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 Home Economics Education.

The 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. See 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.

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 Taylor Endowment. Junior women students in the College of Family Life are eligible to apply for this scholarship established by Thelma Taylor Allison (class of 1927) in memory of her mother.

Coy Fife (Class of 1923) Endowment. Coy Fife established this scholarship endowment to assist needy and deserving direct descendants of his 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 Mr. Jone Shoup Johnson to honor her daughter, a recent graduate of the College of Family Life.

Grace Williams Funk and Kaye Funk (Class of 1947) Endowment. A scholarship to a Utah resident senior or graduate student in the field of clothing and textiles or food service management.

Gerber Companies Foundation Scholarship. Full tuition and fees are awarded each year to a female student in the College of Family Life with a child five years of age or younger. Preference will be given to single parents.

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. See the College of Family Life for details.

Barbara Fitzgerald Hulme (Class of 1942) 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 home economics 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 home economics education, with preference for an individual with 4-H home economics experience.

Katie Karikka (Class of 1938) Endowment. For high school seniors who will enter the College of Family Life majoring in Home Economics Education at USU. See the dean’s office for details.

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. B. Alan Lake and Mrs. Janet Marchant Lake (Class of 1956) Endowment. Available to students who are majoring in Home Economics 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 Lake. Upper class students in need of financial assistance shall receive preference.

Eliza B. Mackey Endowment in Home Economics Education. Established by Reed B. Mackey 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.

Areli 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 Margaret B. Merkley (Class of 1952) Endowment. Student recipients should demonstrate academic achievement, financial need, and personal
established by Cherie and Mercer Trevers and Loretta Trevers Gallent. For undergraduate and graduate students. in Family and Human Development, nutrition at the undergraduate nutrition and food sciences major with high academic standing and potential. See College of Family Life for details.

Marie Stowell Shoup Memorial Endowment. A scholarship in memory of Mrs. Shoup by her husband and daughters for an upper division woman student in Human Environments, based on scholarship and need.

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. See College of Family Life for details.

F. Smith Taggart (Class of 1936) Endowment in Family Life. 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 Lorett Trevers Gallent.

Harris O. and Eleanor Y. Van Orden Endowment. A scholarship for an undergraduate nutrition and food sciences major with high academic record.

Angelyn Widlsey Endowment. A scholarship for an outstanding student in the College of Family Life provided by the Widlsey family and friends in memory of Angelyn Wadley.

Dorothy B. Winsta Endowment. Interest may be used for undergraduate and graduate student scholarships in the College of Family Life.

Leah D. Widtsoe 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.

Ethelwyn Wilcox Endowment. Awarded to worthy students majoring in human nutrition at the graduate or undergraduate level.

Dr. Dale W. and Adelle 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. See Department of Art for details.

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. See History Department for details.

Asa and Vivian Bulen Prelaw Scholarship. Donated in memory of his parents by Richard H. Bulen, this endowment provides resident tuition scholarships for two outstanding prelaw students, senior year only. Apply through Financial Aid Office.

Helen Bulen 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 Cains Scholarship in Music, Art, and Theatre. These scholarships are given in each of the three departments named to students attending USU. See 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. See 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. See 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. See 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. See 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. These scholarships are awarded yearly to three to five students majoring in ceramics. The scholarships begin in the junior year and extend through two years of graduate work. Selection of the recipients will be by the ceramics faculty of 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, see the Music Department.

English Department Memorial Scholarship. An annual scholarship is given in memory of King Hendricks and John Samuel Bullen. See 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. See English Department 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 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. See department chairman for details.

Jay W. Glassmann Family Scholarship. Scholarships endowed by the Glassmann, 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.

LaAnn 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 science major.
work student, on the basis of scholarship, initiative, character, and professional promise. See 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. See 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. See 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. See LAEP Department for details.

Carolyn Tueller Lewis Memorial Vocal Scholarship. Awarded to outstanding voice students. For details, contact the Music Department.

Gloria G. and Marie B. Merrill Scholarship Endowment. A scholarship endowed by Utah radio pioneer Gloria 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. See 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. See 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. See Music Department for details.

Prescott Nibley History Scholarship. A full tuition scholarship for one year to be awarded to an outstanding history student. See 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. See Department of English for details.

George Platz Memorial Scholarships. Symphony orchestra scholarships. See 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. See the Music Department for details.

Kocil 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. See English Department for details.

Walter Siegenthaler Scholarship. A scholarship endowed by the Media Law firm of King & Bullow, 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 Award. A tuition scholarship for full quarter is granted to a senior, given on the basis of competition in poetry, fiction, and drama. See 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. See 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 Thurley Memorial Scholarship. Awarded to students who are in their junior year and who are majoring in oral interpretation. See Department of Theatre Arts for details.

Ev Thorsen Art Scholarship. Funds for students majoring in art at USU. See Art Department 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 pursing 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. See Theatre Arts Department for details.

Angelyn W. Wadley Memorial Scholarship. Awarded in memory of Mrs. Wadley to students in history. See History Department chairman.

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, see Department of Theatre Arts.

John S. and Ulita Welch Prelaw Scholarship. Provides resident tuition scholarships, senior year only, for outstanding students who intend to pursue law as a profession. Apply through Financial Aid Office.

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. See 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 108, for application forms and deadlines.

Joseph Barry Bass Memorial Scholarship. Awarded to an outstanding freshman or sophomore 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 Beerkraft 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. Bex Scholarship. Recipient must be a natural resource student who demonstrates financial need, has potential for excellence, and maintains a 3.25 GPA while receiving the scholarship.

Class of '59 Scholarship. This endowment fund was created and is maintained by contributions from the College of Natural Resources graduating class of 1959. 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.

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.

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 resource 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.

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 resources 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.

S. J. and Jessie E. Quinney Graduate Scholarship. Awarded to the outstanding graduating Quinney Scholar, selected from students who have received an undergraduate Quinney Scholarship and plan to attend graduate school. The award of this scholarship will be determined by cumulative GPA, GRE scores, resume, references, interviews, and a letter of intent.

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.


Gary Smith Scholarship. Awarded to a student, on the basis of academic scholarship, who has the potential to become a "righter of wrongs and a singer of songs."

Society for Range Management—Laurence A. Stoddard 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 State University. Selection is based on GPA, Society for Range Management activities, demonstrated leadership, and potential to contribute to the range management profession.

Laurence A. Stoddard Memorial Scholarship. Recipient must be a sophomore or junior student in the Range Science 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.

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.

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 Award. 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 QAS 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 Amalie F. Hannauer 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 or 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 Abella McGill Scholarships. Scholarships established by Lawrence R. and Abella McGill for students in Physics or Electrical 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. Riemanody Scholarship. A scholarship in memory of Thomas A. Riemanody, a deceased USU undergraduate Geology major. Awarded annually to an outstanding undergraduate Geology major who is not a resident of Utah.

Sealy-Hinckley Scholarship. A scholarship established as a memorial for John H. Sealy 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.

The Barnes Key. Roy 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 Roy 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.

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.

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.

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 Outstanding Faculty. A certificate given annually to a member of the local student chapter of IEEE.

LAEF 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. See 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.

Merk 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 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 Natural Resources. Annual awards given to one senior in each department of the college—Range Science, Forest Resources, Fisheries and Wildlife, Geography and Earth Resources, and the Watershed Science Unit. Based on demonstration of leadership in academic, political, and social activities. Selected by faculty in respective departments.

Dr. 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. See the Admissions and Records 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, see 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. See 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.

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 see 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.

J. Reuben Clark Small Loan Fund. A reserve specifically provided for assistance to students in meeting school obligations.

Latin American Student Loan Fund.

Frischknecht Memorial Fund. A fund established in memory of Dr. Carl O. Frischknecht and his wife, Geniel Lund Frischknecht, by friends, associates, and members of the family to assist students in the College of Agriculture who are in need of short-term loan assistance. Applications should be made in the Financial Aid Office.

Annie Givens Anderson Gardiner 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.

Edwin and Josephine Gusner, 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. See the Director of Cooperative Education for details.

Intercollegiate Knight Loan Fund. Loan fund provided by the Intercollegiate Knights for needy USU students.

O. W. Israelson 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.

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.

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 Nielsen Langford Loan Fund. From a generous gift, a loan fund is to be used by needy home economics students.

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. See Financial Aid Office for details.

George A. Meyers Loan Fund. Established in memory of Dr. Meyers, a friend and benefactor of foreign students, for their emergency needs.

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.

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 see 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. See 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.

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 see the dean’s office, College of Natural Resources.

Ichael 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: Jim Harris
Associate Athletic Director for Internal Operations: Mary Ellen Cloninger
Assistant Director, Business: Ken Peterson
Assistant Director, Media Relations: John G. Lewandowski
Assistant Athletic Director for Support Services and Head Trainer: Dale Mildenberger
Academic Coordinator: Don Ross
Academic Services/Facilities Coordinator: Ken Mitchell
Associate Athletic Director, Media Relations: Tim Monsell
Director, Marketing and Promotions: Jerry Bovee
Director, Athletic Development: Dave Hawk
Faculty Representative: Mike Parent

Head Coaches:

Basketball: Larry Eustachy
Football: Charlie Weatherbie
Golf: Dan Roskelley
Gymnastics: Ray Corn
Softball: Lloydene Searle
Tennis (Men's and Women's): Chris Wright
Track and Field (Men's): Gregg Gensel
Track and Field (Women's): Vaughn Courtney
Volleyball: Marlon Sano
Ticket Manager: Louis Krutsch
Assistant Trainer: Fawn R. Gleckner
Head Strength and Conditioning Coach: Milt White
Equipment Manager: Brad Berlin

The Intercollegiate Athletics program at Utah State encourages excellence in athletic and academic performance. The program is designed to develop qualities of leadership, sportsmanship, and individuality, helping each student athlete to realize his or her ultimate capabilities.

USU's Intercollegiate Athletics operates under the auspices 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 seven men's and seven women's sports.

Utah State has a storied history, gaining national attention in recent years in a number of different sports.

The Aggie football program has proved to be a breeding ground for NFL talent, sending numerous players to the professional ranks in recent years. Currently, five former Aggies dot NFL rosters.

The 1993 Utah State football team finished the regular season as Big West Conference champions and defeated MAC champion Ball State University 42-33 in Las Vegas Bowl II. The Aggies finished the season with a 7-5 record, which included a 58-56 win over rival BYU.

The Aggie softball team finished the 1993 season as Big West champions with a 25-7 conference mark and advanced to the first round of the NCAA Softball Championships. USU softball teams have captured the school's most recent national championships, winning in 1980 and 1981.

Since 1970, the USU basketball team has competed in the NCAA post-season tournament seven times and in the National Invitational Tournament twice.

The Dee Glen Smith Spectrum, home of Utah State basketball (as well as volleyball and gymnastic teams), has welcomed nearly 2,300,000 basketball fans through its doors in the 24 years since construction. In that span, the Smith Spectrum has indeed been "friendly confines" for Aggie basketball, as USU has won over 75 percent of their games at home.

The Aggie gymnastics "dynasty" has sent teams to the national championships five times and to regional championships 15 times in the last 16 years. The 1993 team finished the season ranked 19th in the nation and placed fifth in the Region 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.

Utah State's men's cross country teams won the Big West Conference championship in 1992 and 1993 under head coach Gregg Gensel, who was named 1993 Big West Coach of the Year.

The 1992-93 USU track and field teams enjoyed success with the women's team winning the Big West Conference outdoor championship, and the men's team placing first in the Mountain Pacific Federation indoor championship.

The following individual Aggie athletes have also made their mark during the past few years:

Softball pitcher DeAnna Earsley was named Big West Pitcher of the Year and third-team All-American. Freshman Kathy Beasley was named second-team All-American as a designated player.

Linebacker Jermaine Younger was named first-team All-Big West Conference for the second straight year. Younger was also named Big West Defensive Player of the Year following the 1992 season. Aggie quarterback Anthony Calvillo was named second-team All-conference in 1994 and most valuable player of Las Vegas Bowl II.

Sophomore runner Alisa Nicodemus was named Big West Conference Athlete of the Year for cross country for the second year in a row. Nicodemus was a three-time All-American during the 1992-93 season.

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 actor. Merlin's brother, Phil, also earned consensus All-American honors. Merlin also leads a group of three gridders that have earned Academic All-American honors. The group also
includes Gary Anderson and Randy Stockham. Defensive tackle Steve Neelkeman was named second team academic All-American following the 1991 season.

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. In addition, Academic All-American honors have been bestowed upon Denise Cooper.

The softball team can be proud of the past as well. Four players earned All-American honors during their careers and Leah Young was chosen as an Academic All-American. Former Aggie shortstop Kelly Smith is the only Aggie to have earned All-American status three straight years (1984-86).

Utah State's past wrestling program also boasted 11 All-Americans and one Academic All-American (Bob Erickson).

Participation. The Aggies, as members of the Big West Conference, 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 game 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.

In addition to Big West play, the Aggie's schedule includes many opponents within the intermountain area and the West Coast. Football, basketball, gymnastics, softball, and volleyball teams also compete nationwide.

Facilities. Excellent training and competition facilities are provided in all sports. Romney Stadium seats 30,257 for football crowds, with practice fields adjacent to the stadium. 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 is one of the finest in the nation. The Nelson Recreation Center is the home of the Aggie indoor track and field teams. A 200-meter tartan track is utilized, as well as runways and pits for other events. Outdoors, the Ralph Maughan Stadium is the home for the track teams. The softball team has its own practice and playing facility, Aggie Softball Field, and also has use of the Nelson Recreation Center for indoor practice. The tennis teams practice and play on the HPER courts and in the Nelson Recreation Center. Birch Creek Golf Course and Logan Golf and Country Club are the home courses of the Aggie golf team.

Scholarships. USU offers partial to 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 application.

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, members of the faculty, the alumni, and student organizations.
University Extension

Office in Agricultural Science 209, 797-2200

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Supervisor, 4-H Youth Programs: Scott S. McKendrick
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Science: Antone H. Bringhurst

University Extension
Office in Agricultural Science 209, 797-2200

University Extension includes the Cooperative Extension Service and the Life Span Learning Programs, the latter encompassing the Conference and Institute Division, Class Division, Independent Study (correspondence home-study), evening school, enrichment classes, Uintah Basin Center (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 prepare people to supply educational information.

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.

Life Span Learning Programs

During the past two decades, faculty and administration of the University have strengthened service to residents through the development of the Life Span Learning Programs, a combination of advanced educational philosophy and educational practice. Life Span Learning 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. Life Span Learning 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 Life Span Learning 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, ten 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 Life Span Learning 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 Life Span Learning. The role of this office is to promote, coordinate, and administer conference programs 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 justified 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.

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 Office of Admissions and Records 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 797-2132.

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. An example of classes includes 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 Center for Continuing Education

USU established a Continuing Education Center in the Uintah Basin at the beginning of fall quarter 1967.

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 Center 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

Acting Vice President for Research: Rodney J. Brown
Office in Main 127, 797-1180

Research Programs
Utah Agricultural Experiment Station: Director H. Paul Rasmussen
Engineering Experiment Station: Acting Director Alma P. Moser
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 Foundation: President Bartell C. Jensen
Center for Persons with Disabilities (CFD): 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: Director James P. Dobrowolski

Research Supporting Activity
Contract and Grant Office: Director M. Kay Jeppesen

Research Committees
University Research Council: Acting Chairman Rodney J. Brown
University Safety Committee: Chairman David B. Brown
Radiological Safety Committee: Chairman LeGrande C. Ellis
Committee on Experimental Animals: Chairman Stanley D. Allen
Committee on Human Subjects: Chairman Carol T. Windham
Institutional Biosafety Committee: Chairman John D. Morrey
Indirect Cost Waiver Committee: Secretary M. Kay Jeppesen
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: Roy C. Sidle
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 are in every college and almost every department of the University.
Research is closely associated with teaching and student activities. Most research is conducted by staff members who also teach.
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: Bartell C. Jensen, chairman; A. Bruce Bishop, Acting Provost; M. K. Jeppesen, Contract and Grant Office; Robert W. Schunk, Center for Atmospheric and Space Sciences; Rodney J. Brown, Agriculture; David B. Stephens, Business; Ron J. Thorkildsen, Bureau of Research Services; Izar A. Martinez, Education; Alma P. Moser, Engineering; Bonita W. Wyse, Family Life; Brian L. Pitcher, Humanities, Arts and Social Sciences; Joseph A. Chapman, Natural Resources; James A. MacMahon, Science; James P. Shaver, School of Graduate Studies; H. Paul Rasmussen, Utah Agricultural Experiment Station; David S. Bowles, Utah Water Research Laboratory; Allan J. Steed, Space Dynamics Laboratory; Frederic H. Wagner, Ecology Center; Marvin G. Fifield, Center for Persons with Disabilities; Dennis L. Welker, Faculty Senate; and two student members.

Division of University Research
Acting Vice President for Research: Rodney J. Brown
Office in Main 127

The policy of the University is to encourage and support research and all forms of creative, scholarly activities by 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 over 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 over 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**

**Acting Director:** Alma P. Moser  
**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, risk assessment, transportation, structural systems, geotechnical analysis and buried structures, CAD/CAM, robotics and automation, thermal systems, image processing and compression, computer networking, and parallel computing.

**Utah Center for Water Resources Research (UCWRR)**

**Director:** David S. Bowles  
**Acting Associate Director:** R. Ryan Dupont

**Council Members:** Alma P. Moser, Chair; David S. Bowles, Rodney J. Brown, Joseph A. Chapman, Bartill C. Jensen, 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  
**Acting Associate Director:** R. Ryan Dupont

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 1993 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 lab 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, 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 the 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 ideas about real world problems into the formal training programs of water scientists and engineers. During the 1993 fiscal year, approximately 100 graduate students received over $500,000 in 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. MacMahan

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.

Students are encouraged to actively participate in solving research related problems. 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. These departments include: Chemistry and Biochemistry, Electrical Engineering, Physics, and Plants, Soils, and Biometeorology.

**Utah State University Foundation**

**Chairman of the Board of Trustees:** Glenn Mecham  
**President:** Bartell C. Jensen  
**Vice President:** Don J. Baker  
**Chief Financial Officer:** M. Kay Jeppesen

**dba Space Dynamics Laboratory**

**Division Directors of the Space Dynamics Laboratory:**  
- **Systems Division:** Allan J. Streed  
- **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 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.

**dba Technical Resources Laboratory**

**Director:** Kent W. Henderson

The Technical Resources 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, equipment and facility leasing, product development, manufacturing, marketing, and contracting for services.

**dba Utah Research Institute**

**Director:** David G. Norton

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 111**

The Utah State University affiliated Center for Persons with Disabilities (CPD) is one of approximately 58 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 in rural and remote areas; (3) conducting research projects which will provide additional knowledge and application of materials, strategies, and techniques for the developmentally disabled; and (4) providing technical assistance and training to the
The CPD is located on the University campus in a facility constructed specifically for the program. Various training and service activities are undertaken not only in the facility itself 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, and practicum experience to prepare students to better meet the needs of individuals with disabilities.

The center is governed by a Board of Directors appointed by the University president and 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 200 professionals and classified employees in its many training, research, and service projects. Clients with disabilities (infants through adults) are served directly in day-service programs, and training is provided to more than 1,000 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 the application of artificial intelligence in decision making and services for individuals with disabilities, early intervention services for preschool handicapped and at-risk children, the effects of the immune system on Down syndrome and autism, development of staff training programs utilizing interactive videodiscs, and program development and research in assistive technology.

**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, and (5) represents the college on the University Research Council and on other 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 304*

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 Range Science.

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  
Acting 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.

A coordinating committee, composed of representatives from the Department of Fisheries and Wildlife, U.S. Fish and Wildlife 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) responses of fish populations to alterations of the aquatic environment, (2) behavior and habitat requirements of fish and aquatic invertebrates, (3) genetic studies of fish populations, and (4) threatened and endangered species.

Wildlife emphasis is in 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

Director: James P. Dobrowolski
Office in Biology-Natural Resources 181

The Institute for Land Rehabilitation (ILR) promotes education, and regional and campus-wide communication on land rehabilitation problems. The scope of the Institute includes mined land reclamation, rangeland improvements, watershed management, postburning rehabilitation, native seed collection, and other rehabilitation activities.

The ILR has faculty associates from 15 departments campus-wide. It works to increase interest in land rehabilitation problems and research by University faculty and to increase off-campus visibility of the ILR and its associates. The ILR extends information to agency personnel and consultants throughout the State of Utah with the assistance of extension personnel. To further achieve its objectives, the ILR sponsors workshops, symposia, and short courses with regional participation.

The ILR resides in the Department of Range Science, 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, personnel attached to other Forest Service units, 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, 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.

The professional fields represented at the laboratory at Utah State University include plant physiologists, entomologists, ecologists, hydrologists, 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

Biotechnology is a multi-disciplinary effort drawing upon advances in knowledge and techniques from various academic disciplines. The Biotechnology Center was created in 1986 as a Center of Excellence for the State of Utah. Its purpose is to facilitate the development of biotechnology in teaching and research programs at the University. The center operates three core facility service laboratories to provide essential biotechnology products and services. These include DNA synthesis and sequencing, protein sequencing, peptide synthesis, monoclonal and polyclonal antibody production, immunoassay development, mammalian cell repository, fermentation services, and genetic analysis databasing.

The majority of the laboratory space in the Biotechnology Center is devoted to research laboratories. These are staffed by researchers from various academic departments, as well as their students, who are performing biotechnological research.

Faculty pursuing biotechnology research projects at the center have their academic appointments in many of the various University departments. The Biotechnology Center supports research projects with funding through the Research Faculty Awards program, the Molecular Biology Program, and its own Research Grants program. The Biotechnology Center also assists in technology transfer and the marketing of innovations developed at USU.

The Biotechnology Center is operated by the director and the staff of the service laboratories. The center receives its funding from the Vice President for Research, the Utah Agricultural Experiment Station, and the State of Utah. The Biotechnology Center has a policy board consisting of the Vice President for Research, the director of the Utah Agricultural Experiment Station, and the deans of the Colleges of Agriculture, Engineering, Natural Resources, and Science.

International Programs and Studies

Director, International Programs and Studies: Morris D. Whitaker
Office in Military Science 216, telephone 797-1840

Director, International Irrigation Center: R. Kern Stutler
Director, College of Agriculture: Weldon S. Sleight
Director, Institute for International and Community Development: Brad W. Parlin
Director, Center for International Studies: Yun Kim
Coordinator, College of Business: Gary B. Hansen
Coordinator, College of Education: Varnell A. Bench
Coordinators, College of Engineering: Alma P. Moser (Acting Dean), Wynn R. Walker
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, Gregory K. Perrier
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 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, Mexico, Morocco, Pakistan, Russia, and Senegal.

USAID/USU/IAV University Development Linkages Grant
Coordinator: Gregory K. Perrier

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 exchange under nine different activities. The College of Natural Resources at USU is administering this project with Gregory Perrier as the Campus Coordinator. 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.

U.S. Department of Education FIPSE Grant
College of Natural Resources Study Abroad Program
Coordinator: Gregory K. Perrier

The College of Natural Resources (CNR) has a study abroad program for its undergraduate students. The participating students do coursework and field work in either Iceland, Mexico, or Morocco during a six-month to one-year study abroad experience. No graduate-level study abroad positions are currently available.
World Bank/USU/Morocco National Rangeland Development Strategy
Coordinator: Gregory K. Perrier

USU, in collaboration with Hassan II University, has a World Bank-supported contract with the Ministry of Agriculture in Agrarian Reform in Morocco to develop a national rangeland development strategy. Seven faculty members in the College of Natural Resources are working with their colleagues at Hassan II University to implement this fifteen-month project.

USDA/Bureau of Reclamation/USU
Coordinator: Wynn R. Walker

The Biological and Irrigation Engineering Department is currently under contract with the Bureau of Reclamation, U.S. Department of Interior, to develop, adapt, and verify computer software for the operation and management of the irrigation distribution system in the Nile River Valley of Egypt. Funding for the Bureau of Reclamation project is provided by the USAID program in Egypt.

USDA/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).

USDA/USU Rangeland Research for Increasing Small Ruminant Production (Bolivia—SR-CRSP)
Coordinator: Brian E. Norton

The purpose of this project is rangeland research and training to increase productivity of llama and goats and build scientific capabilities of researchers in developing countries (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.

USU International Irrigation Center
Director: R. Kern Stutler

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. Partin

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
Trustees: Morris D. Whitter 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/USAID/Senegal River Basin
Coordinator: J. Paul Riley

USU is providing technical assistance to assist Senegal in providing schedules of user fees for the Senegal River Basin Development Scheme.

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 and Development: 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, SC 311, 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 and Records: Shirley C. Keyes
Director of Annual Support: Thomas A. Dyson
Director of Corporate and Foundation Development: Steven R. Morris

Student tuition and fees pay only ten percent of USU’s operating budget and state support provides only 32 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.

The Development Office also maintains alumni and donor records. Any changes or corrections may be sent to the above address.

University Alumni Association
President: Richard D. Roberts
Acting Director of Alumni Relations: G. Carlos Smith
Office in the David B. Haight Alumni Center, 797-2055

The Utah State University Alumni Association now numbers more than 100,000 members. This membership includes all who have attended USU for one quarter or more or who have served on the staff of the University.

Purpose: It is the purpose of the Alumni Association to promote the interests and welfare of Utah State University.

Government: The governance of the association is vested in the Alumni Council, composed of at least 15 approved members and ex officio members. The president of the Associated Students organization is a member of the council. The president of the Alumni Association is a member of the Utah State University Board of Trustees. Under the direction of the Alumni Council, the USU Emeriti, Golden Anniversary Club, a Young Alumni Committee, and a Student-Alumni Association sponsor activities for their various constituencies.

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 Outlook, an official publication of USU, full of news and reports on the University. The association maintains alumni volunteers and chapter organizations 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, Distinguished Service Awards, Founders Day, and reunions, as well as aiding in athletic and other school events.

Nora Eccles Harrison Museum of Art
Director and Chief Curator: Steven W. Rosen, 797-0163
Associate Curator: Rose M. Milovich
Education Coordinator: Jeanne Richins
Staff Assistant: Cheryl E. Sampson

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 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
Utah Public Radio
Supervisor: Gerald L. Allen
Program Manager: Richard S. Meng
News Director: Lee M. Austin
Chief Engineer: Clifford J. Smith
Office in Multimedia 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.

University Information News Services
Director of Information Services: JR Allred
Office in Information News Services 206, 797-1353

News Writer/Producer: Craig Hislop
Fine Arts Writer: R. Patrick Williams
Research/Science Writer: Lynette F. Harris
Assistant Director and Editor of Outlook: Clifford R. Cahoon
Editor of Staff News: Elizabeth Walker
Agricultural Information Specialist: John DeVilbiss
Consumer Information Specialist: Dennis L. Hinkamp
University Editor: Linda E. Keith
Catalog Editor and Publication Specialist: Sheri E. Peterson
University Extension Service Editor: Donna Falkenberg

Information 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 Services publishes Outlook and Staff News. Outlook is a periodical devoted to reporting information about Utah State University to alumni, parents, and other friends of the institution. Staff News is a weekly newsletter distributed to University employees.

University Publications Editors
University Editor, Editorial Services: Linda E. Keith
University Catalog Editor and Publication Specialist, Editorial Services: Sheri E. Peterson
University Extension Service Editor: Donna Falkenberg
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College of Natural Resources Development and Public Relations Specialist: Mary Lu Roskelley
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Center for Persons With Disabilities Information Specialist: Kelleen S. Hambly
College of Business Partners Program Editor: Alta Markeson
Communicative Disorders Publication Specialist/Editor: Mary Ann Parlin
Eighteenth-Century Studies Editor: Jeffrey Smitten
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Insights (College of Science Alumni News) Editor: Colette D. Yates

Insites (LAEP Alumni News) Adviser: Michael Lee Timmons
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USU and YOU, High School/College Relations: Mark Tehhoeve
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Affirmative Action/Equal Opportunity Office

Director: Sue Guenter-Schlesinger
Office in Main 255, 797-1266

It is the policy of Utah State University to ensure equal educational and employment opportunity regardless of race, color, religion, age, national origin, or sex, and without regard to marital, parental, 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, play, 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, people with disabilities, and others;

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 and status of underrepresented groups at USU who are prospective or current students, faculty, or 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 255 of Old Main, or call 797-1266. Copies of the complete Affirmative Action Plan are available in the AA/EO Office.
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Assistant Vice President for Extension and Dean, Continuing Education: Rex L. Tueler
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 202-210; UMC 3500; 797-2272
Education; Izar A. Martinez, Dean; Education 109; UMC 2800; 797-1437
Engineering; Alma P. Moser, Acting 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; Main 131; 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

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; V. Philip Rasmussen, 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 117; UMC 5305; 797-2483
Business Administration; Philip R. Swensen, Head; Business 811; UMC 3510; 797-2362
Business Information Systems and Education; Lloyd W. Bartholome, Head; Business 711; UMC 3515; 797-2342
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; Scott A. Chisholm, Head; Animal Science 310; UMC 4605; 797-3292
Communicative Disorders; Thomas S. Johnson, Head; Communicative Disorders 102A; 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 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 Smiten, Head; Ray B. West 201; UMC 3200; 797-2733
Family and Human Development; Jay D. Schvaneveldt, 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; 797-1497
History; Head to be appointed; 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 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 220; UMC 3900; 797-0244
Mechanical and Aerospace Engineering; Frank J. Redd, Head; Engineering Laboratory 178; UMC 4130; 797-2867
Military Science; Major Reed Critchfield, Acting Head; Military Science 104; UMC 9595; 797-1820
Music; Bruce Saperston, Head; Fine Arts Center 107; 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; H. Grant Vest, Head; Agricultural Science 322C; UMC 4820; 797-2233
Political Science; Randy T. Simmons, Head; Main 320C; UMC 0725; 797-1306
Psychology; Michael R. Bertoch, Head; Education 487E; UMC 2810; 797-1460
Range Science; John C. Malechek, Head; Natural Resources 210; UMC 5230; 797-2471
Secondary Education; Head to be appointed; Education 330; UMC 2815; 797-2222
Sociology, Social Work and Anthropology; Michael B. Toney, Head; Main 224; UMC 0730; 797-1230
Special Education; 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); Charles P. Hawkins, Director; Natural Resources 210; UMC 5250; 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; 797-1096
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
Financial Aid Office; Student Center 106; UMC 1800; 797-0173
General Registration, Division of; Student Center 302; UMC 0120; 797-1128
Graduation Office; Student Center 246; UMC 1600; 797-1112
Helpline; Student Center 139A; UMC 0100; 752-3964
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 220; UMC 0175; 797-1733
Parking and Visitor Information; Parking and Visitor Information; 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
Testing Services; University Inn 115; UMC 0118; 797-1004
Veterans Affairs; Student Center 246; UMC 1600; 797-1102
Women’s Center/Re-entry 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


ADAMSON, KATHLEEN A. (1975, 1979) Asst. Director, Career Services and Cooperative Education. BS 1965 University of Utah, MS 1987 Utah State University.


AFLATOONI, KIAN (1987) Adjunct Asst. Prof., Civil and Environmental Engineering. BS 1979, MS 1981 University of Nebraska.


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Faculty and Professional Staff 295
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*Has current assignment with University.
<table>
<thead>
<tr>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>health, 77</td>
</tr>
<tr>
<td>modeling, 130</td>
</tr>
<tr>
<td>Planning, Landscape Architecture and, 161-163</td>
</tr>
<tr>
<td>soil/water science, 74, 194</td>
</tr>
<tr>
<td>studies, 30, 127, 128</td>
</tr>
<tr>
<td>Equal Opportunity, 2, 256</td>
</tr>
<tr>
<td>Equipment Services, Library, 224</td>
</tr>
<tr>
<td>Estimated costs, 13, 227</td>
</tr>
<tr>
<td>Europe history courses, 144, 146</td>
</tr>
<tr>
<td>Evening school, 246</td>
</tr>
<tr>
<td>Examination, credit by, 9, 26, 164</td>
</tr>
<tr>
<td>fee, 12</td>
</tr>
<tr>
<td>Exchange programs, 11, 30-31</td>
</tr>
<tr>
<td>Exercise science, 135</td>
</tr>
<tr>
<td>Expenses for education, 13, 227</td>
</tr>
<tr>
<td>Experiment Station</td>
</tr>
<tr>
<td>Agricultural, 36, 247-248, 252</td>
</tr>
<tr>
<td>Engineering, 45, 46, 93, 248</td>
</tr>
<tr>
<td>Extension</td>
</tr>
<tr>
<td>agents, 244-245</td>
</tr>
<tr>
<td>Class Division, 246</td>
</tr>
<tr>
<td>credits, 18, 19</td>
</tr>
<tr>
<td>Independent Study, 18, 246</td>
</tr>
<tr>
<td>program specialists, 244</td>
</tr>
<tr>
<td>publications, 244, 255</td>
</tr>
<tr>
<td>representatives with colleges, 245</td>
</tr>
<tr>
<td>Service, Cooperative, 245</td>
</tr>
<tr>
<td>University, 244-246</td>
</tr>
<tr>
<td>Faculty, 260-302</td>
</tr>
<tr>
<td>adviser, 21, 28</td>
</tr>
<tr>
<td>and professional staff, 260-302</td>
</tr>
<tr>
<td>Emeritus, 297-302</td>
</tr>
<tr>
<td>Federal Collaborators, 296</td>
</tr>
<tr>
<td>Falsification, 16</td>
</tr>
<tr>
<td>Family</td>
</tr>
<tr>
<td>and Human Development</td>
</tr>
<tr>
<td>courses, 123</td>
</tr>
<tr>
<td>Department of, 121-124</td>
</tr>
<tr>
<td>Life, College of, 47-48</td>
</tr>
<tr>
<td>academic service office, 28</td>
</tr>
<tr>
<td>admission requirements, 47</td>
</tr>
<tr>
<td>course, 48</td>
</tr>
<tr>
<td>departments and programs, 47</td>
</tr>
<tr>
<td>Major, General, 47-48</td>
</tr>
<tr>
<td>scholarships, 232-236</td>
</tr>
<tr>
<td>Educational Rights and Privacy Act, 2, 14</td>
</tr>
<tr>
<td>relationships, marriage and, 122</td>
</tr>
<tr>
<td>Farming, 193</td>
</tr>
<tr>
<td>Fashion merchandising (see apparel merchandising)</td>
</tr>
<tr>
<td>Federal Aviation Administration, 151, 152</td>
</tr>
<tr>
<td>Federal</td>
</tr>
<tr>
<td>collaborators, 296,</td>
</tr>
<tr>
<td>documents, 224</td>
</tr>
<tr>
<td>Work Study, 227</td>
</tr>
<tr>
<td>Fees and refunds, 11-13</td>
</tr>
<tr>
<td>Festival of the American West, 225</td>
</tr>
<tr>
<td>Final Grade Report, 15</td>
</tr>
<tr>
<td>Finance, 82, 83</td>
</tr>
<tr>
<td>Finance Club, 40</td>
</tr>
<tr>
<td>Financial Aid</td>
</tr>
<tr>
<td>and Scholarship Information, 227-241</td>
</tr>
<tr>
<td>method of awarding, 227</td>
</tr>
<tr>
<td>Office, 227</td>
</tr>
<tr>
<td>responsibility of recipients, 228</td>
</tr>
<tr>
<td>Financial obligations, 18</td>
</tr>
<tr>
<td>outstanding, 12, 18</td>
</tr>
<tr>
<td>Fine Arts</td>
</tr>
<tr>
<td>Bachelor of, 69, 219</td>
</tr>
<tr>
<td>Master of, 70, 219</td>
</tr>
<tr>
<td>Fish and Wildlife Research Unit, Utah Cooperative, 124, 250-251</td>
</tr>
<tr>
<td>Fisheries and Wildlife</td>
</tr>
<tr>
<td>courses, 125</td>
</tr>
<tr>
<td>Department of, 124-126</td>
</tr>
<tr>
<td>ecology, 124</td>
</tr>
<tr>
<td>management, 124</td>
</tr>
<tr>
<td>minor, 125</td>
</tr>
<tr>
<td>Fitness, Physical, 133</td>
</tr>
<tr>
<td>Flight technology, 151, 152</td>
</tr>
<tr>
<td>Folklore courses, 145</td>
</tr>
<tr>
<td>Food</td>
</tr>
<tr>
<td>and bioprocess systems engineering, 73, 74</td>
</tr>
<tr>
<td>marketing, 107</td>
</tr>
<tr>
<td>production, 107</td>
</tr>
<tr>
<td>science, 187-188</td>
</tr>
<tr>
<td>Sciences, Department of Nutrition and, 187-189</td>
</tr>
<tr>
<td>Technologists, Institute of, 187</td>
</tr>
<tr>
<td>Football, 242</td>
</tr>
<tr>
<td>Foreign</td>
</tr>
<tr>
<td>aid programs, 252-253</td>
</tr>
<tr>
<td>language</td>
</tr>
<tr>
<td>required for Bachelor of Arts degree, 17</td>
</tr>
<tr>
<td>languages (see Languages and Philosophy)</td>
</tr>
<tr>
<td>participant training, 253</td>
</tr>
<tr>
<td>students, tuition and fees for, 11</td>
</tr>
<tr>
<td>Forestry</td>
</tr>
<tr>
<td>biology, 127</td>
</tr>
<tr>
<td>ecology, 127</td>
</tr>
<tr>
<td>economics and policy, 127</td>
</tr>
<tr>
<td>management, 127</td>
</tr>
<tr>
<td>range management, 204</td>
</tr>
<tr>
<td>recreation, 127</td>
</tr>
<tr>
<td>Resources</td>
</tr>
<tr>
<td>Department of, 127-129</td>
</tr>
<tr>
<td>watershed management, 127</td>
</tr>
<tr>
<td>Foresters, accredited by Society of American, 5, 127</td>
</tr>
<tr>
<td>Forestry</td>
</tr>
<tr>
<td>computer, 128</td>
</tr>
<tr>
<td>courses, 128</td>
</tr>
<tr>
<td>Master of, 127</td>
</tr>
<tr>
<td>Sciences Laboratory, USDA, 251</td>
</tr>
<tr>
<td>summer camp, 128</td>
</tr>
<tr>
<td>urban, 128</td>
</tr>
<tr>
<td>Founded in 1888, USU, 5</td>
</tr>
<tr>
<td>Founders Day, 254</td>
</tr>
<tr>
<td>Four-H</td>
</tr>
<tr>
<td>scholarships, 228, 229</td>
</tr>
<tr>
<td>youth programs, 244</td>
</tr>
<tr>
<td>France, quarter in, 30, 165</td>
</tr>
<tr>
<td>French courses, 165</td>
</tr>
<tr>
<td>Freshman</td>
</tr>
<tr>
<td>admission, 8</td>
</tr>
<tr>
<td>classification, 14</td>
</tr>
<tr>
<td>Full-time status, 13</td>
</tr>
<tr>
<td>Fundamentals of Engineering Exam, 93</td>
</tr>
<tr>
<td>Game-range management, 204</td>
</tr>
<tr>
<td>GED (General Education Development) test, 8, 9</td>
</tr>
<tr>
<td>General</td>
</tr>
<tr>
<td>Catalog, cost of, 12</td>
</tr>
<tr>
<td>Education, 21-28</td>
</tr>
<tr>
<td>Area Studies option, 25-26, 34</td>
</tr>
<tr>
<td>courses, summary of, 23-28</td>
</tr>
<tr>
<td>Development Test (GED), 8, 9</td>
</tr>
<tr>
<td>Engineering major requirements, 27-28</td>
</tr>
<tr>
<td>transfer credit for, 10, 27</td>
</tr>
<tr>
<td>Engineering</td>
</tr>
<tr>
<td>courses, 45</td>
</tr>
<tr>
<td>two-year program, 45</td>
</tr>
<tr>
<td>major in Family Life, 47-48</td>
</tr>
<tr>
<td>Registration, 9, 28, 31, 226</td>
</tr>
<tr>
<td>fee for, 12</td>
</tr>
<tr>
<td>Geoarchaeology, 133</td>
</tr>
<tr>
<td>Geography and Earth Resources</td>
</tr>
<tr>
<td>courses, 130</td>
</tr>
<tr>
<td>teaching major and minor, 206</td>
</tr>
<tr>
<td>Department of, 130-132</td>
</tr>
<tr>
<td>Geology</td>
</tr>
<tr>
<td>courses, 133</td>
</tr>
<tr>
<td>Department of, 132-135</td>
</tr>
<tr>
<td>ecology, 132</td>
</tr>
<tr>
<td>minor, 133</td>
</tr>
<tr>
<td>teaching minor, 133</td>
</tr>
<tr>
<td>German courses, 156</td>
</tr>
<tr>
<td>Germany, quarter in, 31, 50</td>
</tr>
<tr>
<td>Gerontology program, 33, 209</td>
</tr>
<tr>
<td>Gifted and talented education, 114</td>
</tr>
<tr>
<td>Gifts to USU, 254</td>
</tr>
<tr>
<td>Gold &quot;A&quot; pins for scholarship, 16, 240</td>
</tr>
<tr>
<td>Golf, 242</td>
</tr>
<tr>
<td>Government</td>
</tr>
<tr>
<td>Documents, Library, 224</td>
</tr>
<tr>
<td>Internship Program, 198</td>
</tr>
<tr>
<td>Grade point average (GPA), 8, 14, 18</td>
</tr>
<tr>
<td>accepted for transfer students, 9</td>
</tr>
<tr>
<td>high school, 8</td>
</tr>
<tr>
<td>required (see individual departments for requirements above those of University), 18</td>
</tr>
<tr>
<td>Grade report, final, 15</td>
</tr>
<tr>
<td>Grades,</td>
</tr>
<tr>
<td>accepted toward graduation, 14</td>
</tr>
<tr>
<td>change of, 15</td>
</tr>
<tr>
<td>incomplete, 18</td>
</tr>
<tr>
<td>report of, 15</td>
</tr>
<tr>
<td>Grading, 14-15</td>
</tr>
<tr>
<td>Graduate</td>
</tr>
<tr>
<td>admission, 10</td>
</tr>
<tr>
<td>catalog, 226</td>
</tr>
<tr>
<td>Council, 226</td>
</tr>
<tr>
<td>courses, 19</td>
</tr>
<tr>
<td>Student Senate, 226</td>
</tr>
<tr>
<td>Studies, School of, 5, 10, 226</td>
</tr>
<tr>
<td>Graduation, 8</td>
</tr>
<tr>
<td>application for, 12, 18</td>
</tr>
<tr>
<td>deadlines, 18</td>
</tr>
<tr>
<td>fee, 12, 18</td>
</tr>
<tr>
<td>honors at, 18</td>
</tr>
<tr>
<td>requirements, 16-18</td>
</tr>
<tr>
<td>Grants, 227</td>
</tr>
<tr>
<td>Graphic design, 70</td>
</tr>
<tr>
<td>Greek</td>
</tr>
<tr>
<td>courses, 166</td>
</tr>
<tr>
<td>language minor, 50</td>
</tr>
<tr>
<td>greenhouse management, 193</td>
</tr>
<tr>
<td>Guitar certificate/diploma, 183</td>
</tr>
<tr>
<td>Gymnastics, 242</td>
</tr>
<tr>
<td>Handicapped</td>
</tr>
<tr>
<td>Materials for, 2</td>
</tr>
<tr>
<td>Persons, Developmental Center for (see Center for Persons with Disabilities)</td>
</tr>
<tr>
<td>Students, 31</td>
</tr>
<tr>
<td>Hard of hearing, 100</td>
</tr>
<tr>
<td>HASS (see Humanities, Arts and Social Sciences)</td>
</tr>
<tr>
<td>Health</td>
</tr>
<tr>
<td>and accident insurance, 12</td>
</tr>
<tr>
<td>Education, 136</td>
</tr>
<tr>
<td>courses, 137</td>
</tr>
<tr>
<td>teaching major and minor, 206</td>
</tr>
<tr>
<td>Physical Education and Recreation</td>
</tr>
<tr>
<td>courses, 137</td>
</tr>
<tr>
<td>Department of, 135-142</td>
</tr>
<tr>
<td>Public, 76, 77</td>
</tr>
<tr>
<td>services, 226</td>
</tr>
<tr>
<td>Hearing, hard of, 100</td>
</tr>
<tr>
<td>Helpline/Information Referral, 226</td>
</tr>
<tr>
<td>Herbarium, 78</td>
</tr>
<tr>
<td>High School/College Relations, 226</td>
</tr>
<tr>
<td>High School Curriculum, 8</td>
</tr>
<tr>
<td>Hill Air Force Base/Ogden Center, 244</td>
</tr>
<tr>
<td>History</td>
</tr>
<tr>
<td>courses, 144</td>
</tr>
<tr>
<td>Department of, 143-146</td>
</tr>
<tr>
<td>minor, 143</td>
</tr>
<tr>
<td>teaching major and minor, 206</td>
</tr>
<tr>
<td>Home Economics</td>
</tr>
<tr>
<td>Association, accredited by Council of Professional Development of American, 5</td>
</tr>
<tr>
<td>Education, 147, 206</td>
</tr>
<tr>
<td>Homecoming, 254</td>
</tr>
<tr>
<td>Home study (Independent Study), 18, 246</td>
</tr>
<tr>
<td>Honesty, academic, 16</td>
</tr>
<tr>
<td>Honor roll, 16</td>
</tr>
<tr>
<td>Honors</td>
</tr>
<tr>
<td>at graduation, 18</td>
</tr>
<tr>
<td>awards and, 239-241</td>
</tr>
<tr>
<td>courses, 29</td>
</tr>
<tr>
<td>program, 29, 54</td>
</tr>
<tr>
<td>courses, designations, 19</td>
</tr>
<tr>
<td>Horse</td>
</tr>
<tr>
<td>production minor, 65</td>
</tr>
<tr>
<td>training minor, 65</td>
</tr>
<tr>
<td>Horticulture, 30, 193, 194</td>
</tr>
<tr>
<td>Housing</td>
</tr>
<tr>
<td>fees, 13</td>
</tr>
</tbody>
</table>
Nutrition and Northwest Association of
Normal registration for full-time student, 13
Nonresident fees, 11
No-test days, 4, 13
Newspapers, 97
Nelson Recreation Center, 243
Multimedia and Distance Learning Services, 224
Museum of Art, 245-255
Music
Bachelor of, 183
certificate, 33
courses, 183
Department of, 182-186
education, 183, 206
tours, 12
minor, 183
therapy, 183
West, 225
Narrative Theatre, 219
Natural
Association for Music Therapy, 183
Association of Schools of Music, accredited by, 5, 182
Association of Social Workers, 212
Collegiate Athletic Association (NCAA), 242-243
Council for Accreditation of Teacher Education (NCATE), accredited by, 5, 41, 100
Direct Student Loan (see Perkins Loan) Guard, 32, 180-181
Intercollegiate Flying Association, 45
League for Nursing, accredited by, 5, 223
Student Exchange, 30-31
University Continuing Education Association, 246
Natural Resources
College of, 51-52
academic service office, 28
admission, 51
career opportunities, 51
courses, 52
departments and programs, 51
environmental studies, 30, 127, 128
graduation requirements, 52
scholarships, 52, 227-238
tuition, 51
summer camp, 51
Institute for Social Science Research on, 251
Policy, 127
NCATE, 5, 41, 100
Nelson Recreation Center, 243
Networking, computer, 224
News releases, 225
Newspapers, 97
No-test days, 4, 13
Non-U.S. citizens, tuition and fees for, 11-12
Nora Eccles Harrison Museum of Art, 69, 254-255
Normal registration for full-time student, 13
Northwest Association of Schools and Colleges, accredited by, 5
Note fee, deferred, 12
Numbering system, course, 19
Nursing
courses, 223
National League for, 5, 223
Program, 30, 223
Utah State Board of, 223
Nutrition and Food Sciences,
courses, 188
Department of, 187-189
minor, 187
Nutrition Science, 187, 188
Office systems management, 86
Office systems support, 30, 85, 87
Offices, directory of
Colleges, 258
Departments, 258-259
Student Services, 259
Old Lyric Repertory Company, 219, 225
Old Main Society, 254
On-the-job training, 31-32
One-year certificate programs, 17
agricultural machinery technology, 30, 61
dairy technology, 17
ornamental horticulture, 30, 193, 194
Opportunity, equal, educational and employment, 2, 256
Organ certificate/diploma, 183
Organic chemistry, 89
Organizational communication minor, 164, 165
Ornamental horticulture, 30, 193, 194
Outlook, 255
Painting, 69
Packaging, 12, 226
Parks and Recreation, 137
courses, 139
Pass, D+, D, F, option, 13, 14
Pathology, speech-language, 100
Pell Grant, 227
Performance
music, 183
theatre, 219
Periodicals, Library, 11
Professional courses, 138
Professional education component, 206
Engineering societies, 45
Flight Society, 45
organizations in business, 40
staff, 250-302
Technology Program, 151
Proficiency tests in language, 164
Proof of identification, 13
Psychological Association, accredited by American, 5
Psychology
courses, 201
Department of, 200-203
teaching major and minor, 206
Public and Technical Services, Library, 224
Health, 76, 77, 93
courses, 81
Radio, Utah, 255
relations, 97
Publication Design and Production, 224
Publications, University of
cost of, 12
editors, 255
Quadrangle scholarship, 229
Quarterly system at USU, 19
Radio, 97
Utah Public, 255
Range
animal nutrition, 204
ecology, 204
economics, 204
management, 204
rehabilitation, 204
research in developing countries, 253
Science
courses, 204
Department of, 203-205
wetland management, 204
wildlife relations, 204
Rangers, 181
Rare books and printed matter, 224
Readmission, 10
Reaplication for graduation, 18
Recitals and concerts, music, 183
Records, 8, 14
hold, 15
Recreation
Center, 243
Education activity courses, 140

PLUS Loans, 227
Policies and practices, updated in schedule of classes, 19
Political
Economy, Institute of, 250
Science
courses, 199
Department of, 198-200
teaching major and minor, 206
Portuguese courses, 167
Practicum
fee, piano, 12
teaching, 114, 206
Predator Ecology and Behavior Project, 124
Prejudice, 76
Precise, course, 19-20
Prelaw, 108, 198
Premedical, 76
Preprofessional program, 64
Primates, 97
Printing Services (see Publication Design and Production)
Prismaking, 69
Privacy rights, 2, 14
Probation, low scholarship and, 15, 16, 31
Production
groups and theatres, 219
management, 82, 83
Professional
education component, 206
engineering societies, 43
Flight Society, 45
organizations in business, 40
staff, 250-302
Technology Program, 151
Proficiency tests in language, 164
Proof of identification, 13
Psychological Association, accredited by American, 5
Psychology
courses, 201
Department of, 200-203
teaching major and minor, 206
Scheduling, 8, 226
Schoolcraft
“A” pins, 16, 240
low, 15, 31
Scholarships, 228-239
AFROTC, 38
athletic, 239, 243
donor, 228-239
ROTC, 181
tuition, 229
waiver, 228
Scholastic marks, 14
School
counseling, 201
health, 136
of Accountancy, 55-58
of Graduate Studies, 5, 10, 226
library media teaching minor, 157
psychology, 201
relations, High School/College, 226
Science
Bachelor of, 16 (see also departmental sections)
College of, 53-54
academic service office, 28
admission requirements, 53
Advanced Placement credit, 53
courses, 54
departments and programs, 53
General Requirements, 53, 76, 90,
103, 133, 173, 190
Honors Program, 54
orientation requirement, 53
scholarships, 54, 238-239
Written Communications Requirement, 53,
76, 90, 103, 133, 173, 190
RSAA Advising Center, 49, 54
majors, 54
Master of, 16 (see also departmental sections)
Sculture, 69
Second bachelor’s degree, 18, 40
Secondary Education
courses, 207
Department of, 205-208
Senior classification, 14
Serials and Binding, Library, 224
Sexual harassment prohibition, 2, 256
Sheep and wool production minor, 65
Sigma Iota Epsilon, 40, 171
Small Business Development Center, 38
South Spectrum, 243
Smoking policy, 20
Social
Science Research on Natural Resources,
Institute for, 231
Sciences (SS), General Education courses, 24
Science, Master of, 38, 106, 144, 210
studies teaching major, 206
Work, 211-213
courses, 212
dual major with sociology, 209
Education, accredited by Council on, 5, 212
minor, 212
Society for
Human Resource Management (SHRM), 40, 171
Range Management, accredited by, 5
Society of
American Foresters, accredited by, 5, 127
Environmental Engineering Students, 45
Manufacturing Engineers, 45
Women Engineers, 45
Sociology, Social Work and Anthropology
courses, 210
Department of, 208-215
Sociology teaching major and minor, 206
SODIA program in Elementary Education, 114
Softball, 242
Soil and water resource systems engineering, 73, 74
Soil Science and Biometeorology (see Plants, Soils, and
Biometeorology)
Soil Science courses, 196
Sophomore classification, 14
Southeastern Utah Center (Moab), 246
Soviet Union tour, 165
Space Dynamics Laboratory, 45-46, 249
Space Shuttle, 46, 112
Spanish courses, 168
Special
certificate programs, 33
area studies, 33
gerontology, 33
international relations, 33
music, 33
Collections and Archives, 224
Education
courses, 216
Department of, 215-218
dual certification, 115, 206-207
examination
credit by, 9, 26, 164
fee, 12
funds, 12
programs, 29
Specialists, Extension, 244
Spectrum, 243
Speech
communication minors, 164, 165
courses, 169
Language-Hearing Association—Educational
Standards Board, accredited by American, 100
language pathology, 100
Pathology and Audiology, American Boards
of Examiners, 5
teaching minor, 206
Split form, 18
Sports, Men and Women, 242-243
Spouse validation sticker, 12
Staff News, 225
Stafford Loan (GLS), 227
Stadium, 243
State
arborum at USU, 251
Board of Regents, 5, 257
Student Incentive Grant (SSIG), 227
Statesman, The, 255
Statistics, 174
courses, 176
Department of Mathematics and, 173-177
-mathematics major, 174
minor, 174
Stop-out, 10
Student
access to educational records, 14
body, 5
Center, Taggart, 226
classification, 14
Development, 226
Health Services, 226
housing, 226
Incentive Grant, State, (SSIG), 227
loans, 227, 240-241
obligation to ascertain rules, 2, 17
publications, 226
responsibility, 2, 17
Services, 226
directory of, 259
Teaching, 114, 206
Studies
American, 118, 209
Area, 30, 33, 49
Graduate, School of, 5, 10, 226
Studio Stage, 219
Study abroad programs, 31, 49, 50
Summa cum laude, 18
Summary of
General Education requirements, 21-28
graduation requirements, 16-18
Summer
camp
trees, 51-52
range science, 204
watered, 222
citizens, 226
scholarship, 229
fees, 11
Two-year Associate of Applied Science degree, 16
general requirements for, 17
in agricultural machinery technology, 30, 61
in drafting, 30, 151, 153
in office systems support, 30, 85, 87
Two-year diplomas
in guitar, 187
in organ, 183
in piano, 183

Utah Basin Center for Continuing Education, 246
Undeclared Program, 48-49
Academic Service Office, 28

Undergraduate catalog, cost of, 12
majors, 22-23
United States history courses, 145, 146
University academic scholarships, 228
Academic Service Center, 13, 28, 226
administration, 13
Alumni Association, 254
Archives, 224
Board of Trustees, 5, 257
Club Scholarships, 229
Counseling Center, 31, 226
Development Office, 254
Extension, 5, 244-246
Faculty, 260-262
Honors, 29
Information News Services, 255
Jan, 245
Library, 224
Mail Codes (UMCs), 258-259
professional staff, 260-302
publications
cost of, 12
editors, 255
Relations and Development, 254-255
Research, 247-252
council, 247
smoking policy, 20
Upper division courses, 19
credit, 17
requirements, 28
Urban Forestry, 257
USDA-USU contracts, 252-253
USDA Forestry Sciences Laboratory, 251
U.S. citizens, tuition and fees for, 11-12
USA Board of Trustees, 257
Press, 255
Residence Centers, 17, 18, 246
Utah
Agricultural Experiment Station, 36, 247-248, 252
Center for Water Resources Research (UCWR), 248
College Library Consortium, 224
Cooperative Fish and Wildlife Research Unit, 124, 250-251
Festival Opera, 225
Public Radio, 255
Research Institute, 249
State Board of Education, 41
State Board of Education—Teacher Education Program, accredited by, 5
State Board of Nursing, 223
State Board of Regents, 5, 257
State Board of Social Work Examiners, 212
State Board of Trustees, 5
State Board of Vocational Education, accredited by, 5
State Children’s Theatre, 219
State Office of Education, 100, 115

State Theatre, 219
State University (see also USU)
accreditation, 5
Foundation, 249
governance, 5
Mission Statement, 5
size, 5
summary statement concerning, 5
System, credit transfer policy of, 9
Transportation Center, 42, 46, 93
Water Resources Laboratory (UWRL), 46, 93, 112, 248-249

Validation sticker, activity, 12
Variable credit, 19
Vertebrate collection, 78
Veterans Educational Benefits, 8, 9, 58, 226
and dropping courses, 13
eligibility, 13
Veterinary science, 64
Visitor fee (audit), 12
Visually impaired, aids for, 31
Vocational Education, 152
accredited by Utah State Board of, 5
home economics education, 147
rehabilitation, 31
Volleyball, 342
Waiver
scholarships, 228
Warning status, academic, 15
Waste Management, 93
Water
Research Laboratory, Utah, 46, 93, 112, 248-249
Resources Research, 248
Watershed
forest, 127
Science, 222-223
courses, 222
minor, 222
Weber State University/USU Cooperative Nursing Program, 30, 223
Welding, 125
Western
American Literature, 49, 255
Historical Quarterly, 49, 255
Interstate Commission for Higher Education (WICHBE), 64, 65
Undergraduate Exchange, 11
Writer’s Conference, 49
Wildlife
ecology, 124
Fisheries and, 124-126
management, 124
minor, 125
Research Unit, 124, 250-251
Winter Quarter
in Latin America, 165
in Mexico, 31, 50
Withdrawal from the University, 13
Women’s Center, 226
Center scholarships, 229
Studies, 30, 33, 49
Workshops, summer, 225
Work study, 227
Written communication requirement, 21
in Business, 39
in Education, 41
in Science, 53
Writing option, English major, 117-118
Zoology courses, 81