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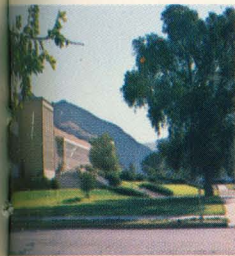
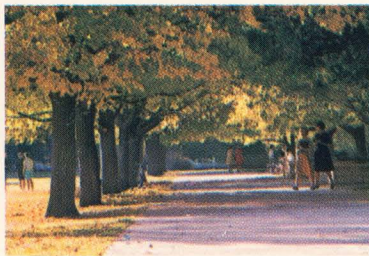
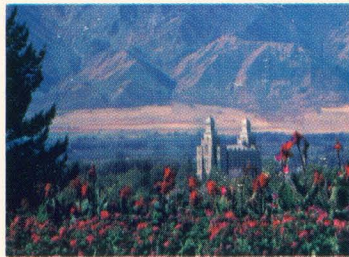
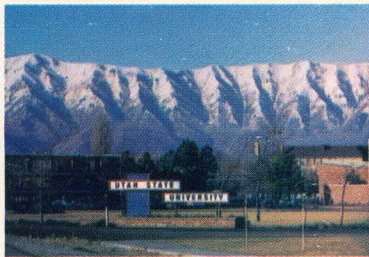
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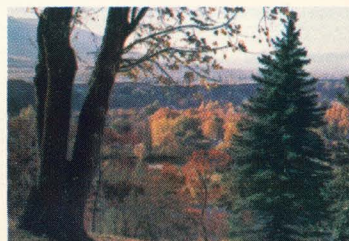






# UTAH STATE UNIVERSITY BULLETIN

1968-69 CATALOG - LOGAN, UTAH







Utah State University Bulletin Volume 68, Number 4,  
April 1968. Issued monthly at Logan, Utah, 84321.  
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# UTAH STATE UNIVERSITY

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LOGAN, UTAH  
1968-1969  
CATALOG

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# Utah State University

Utah State University was founded in 1888 as a part of the public educational system of Utah. It operates under the constitution and laws of the state.

USU belongs to a great family of institutions known as land-grant universities, which had their origin in 1862. As a land-grant school, it is a university in the fullest and best sense of that phrase. It offers a rich curriculum in the arts and sciences, in both undergraduate and graduate programs. Degrees granted include the Bachelor of Arts (BA), the Bachelor of Science (BS), the Master of Arts (MA), the Master of Science (MS), several other Bachelor's and Master's degrees, Specialist in Educational Administration, the Doctor of Education (EdD), and Doctor of Philosophy (PhD).

USU includes eight resident colleges with fifty-four departments, a School of Graduate Studies, extension services, research programs, and one branch college: Snow College at Ephraim. It participates in educational aid to several foreign countries.

The University is accredited by the Northwest Association of Secondary and Higher Schools. It is on the accepted list of the Association of American Universities and of the American Association of University Women. It is a member of the American Council on Education and is listed by other accrediting agencies.

A fourteen-member Board of Trustees is the governing body of the University. Twelve are appointed by the Governor and ratified by the State Senate. Two others serve ex-officio: the Secretary of State and the President of the University Alumni Association. The Board elects its chairman and vice-chairman. All members serve without monetary pay.

Dr. Glen L. Taggart is the eleventh president of USU. He takes office July 1, 1968. Previous presidents, and the year of their appointment, have been as follows: J. W. Sanborn, 1890; J. H. Paul, 1894; J. M. Tanner, 1896; W. J. Kerr, 1900; John A. Widtsoe, 1907; E. G. Peterson, 1916; Franklin S. Harris, 1945; Louis L. Madsen, 1950; Henry Aldous Dixon, 1953; Daryl Chase, 1954, president emeritus, effective July 1, 1968.

## 1968

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JAN.	1	2	3	4	5	6		JULY	1	2	3	4	5	6						
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	28	29	30						NOV.			1	2	3	4	5	6	7	8	9
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## 1969

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MAR.	1	2	3	4	5	6	31						
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28	29	30					23	24	25	26	27	28	29
JUNE	1	2	3	4	5	6	30						
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## 1970

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JAN.	1	2	3				JULY	1	2	3	4		
4	5	6	7	8	9	10	5	6	7	8	9	10	11
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25	26	27	28	29	30	31	26	27	28	29	30	31	
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22	23	24	25	26	27	28	23	24	25	26	27	28	29
29	30	31					30	31					
MAR.	1	2	3	4	5	6	SEP.	1	2	3	4	5	
7	8	9	10	11	12	13	6	7	8	9	10	11	12
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28	29	30					27	28	29	30			
APR.	1	2	3	4	5	6	OCT.	1	2	3	4	5	
7	8	9	10	11	12	13	4	5	6	7	8	9	10
14	15	16	17	18	19	20	11	12	13	14	15	16	17
19	20	21	22	23	24	25	18	19	20	21	22	23	24
26	27	28	29	30			25	26	27	28	29	30	31
MAY	1	2	3	4	5	6	NOV.	1	2	3	4	5	6
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JUNE	1	2	3	4	5	6	DEC.	1	2	3	4	5	6
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14	15	16	17	18	19	20	13	14	15	16	17	18	19
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## 1971

S	M	T	W	T	F	S	S	M	T	W	T	F	S
JAN.	1	2	3	4	5	6	JULY	1	2	3	4	5	6
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21	22	23	24	25	26	27	22	23	24	25	26	27	28
28	29	30					29	30	31				
MAR.	1	2	3	4	5	6	SEP.	1	2	3	4	5	6
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21	22	23	24	25	26	27	19	20	21	22	23	24	25
28	29	30	31				26	27	28	29	30		
APR.	1	2	3	4	5	6	OCT.	1	2	3	4	5	6
7	8	9	10	11	12	13	3	4	5	6	7	8	9
14	15	16	17	18	19	20	10	11	12	13	14	15	16
21	22	23	24	25	26	27	17	18	19	20	21	22	23
28	29	30					24	25	26	27	28	29	30
MAY	1	2	3	4	5	6	31						
7	8	9	10	11	12	13	NOV.	1	2	3	4	5	6
14	15	16	17	18	19	20	7	8	9	10	11	12	13
21	22	23	24	25	26	27	14	15	16	17	18	19	20
28	29	30					21	22	23	24	25	26	27
JUNE	1	2	3	4	5	6	28	29	30				
7	8	9	10	11	12	13	DEC.	1	2	3	4	5	6
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28	29	30					19	20	21	22	23	24	25
							26	27	28	29	30	31	



# Calendar, 1968-69

## Summer Quarter 1968

June 17, Monday	Registration
June 18, Tuesday	Classwork begins
July 19, Friday	End of first session
July 22, Monday	Registration for second session
August 23, Friday	End of Summer Quarter

## Fall Quarter 1968

Early in September	Faculty Meeting
September 25, Wednesday	Testing for entering freshmen Orientation and English placement for all entering foreign students
September 26, Thursday	Orientation
September 27, Friday	New student registration
September 28, Saturday	Former student registration
September 30, Monday	Classwork begins
November 3-17 (tentative)	Winter Quarter Pre-Registration
November 28, 29, Thurs., Fri.	Thanksgiving recess
December 13, Friday	Classwork ends
December 16-19, Mon.-Thurs.	Final examinations

## Winter Quarter 1969

January 3, Friday	Registration
January 4, Saturday	Registration
January 6, Monday	Classwork begins
March 14, Friday	Classwork ends
March 17-20, Mon.-Thurs.	Final examinations

## Spring Quarter 1969

March 24, Monday	Registration
March 25, Tuesday	Registration
March 26, Wednesday	Classwork begins
May 29, Thursday	Classwork ends
May 30, Friday	Memorial Day Holiday
June 2-5, Mon.-Thurs.	Final examinations
June 6, Friday	Baccalaureate
June 7, Saturday	Commencement

# Tuition and Other Fees

The University reserves the right to alter any of these charges without notice.

## Fees Per Quarter

\*Summer, Fall, Winter, and Spring Quarters

	Resident Students	Non-Resident Students
Tuition and Registration .....	\$ 90	\$256
Other Fees .....	\$ 25	\$ 25
Total Fees .....	\$115	\$281

\*Non-Resident (Non-Utah) students pay the Resident Schedule Summer Quarter.

## Other Fees, Costs

**Application and Evaluation Fee** (non-refundable): \$10

**Health and Accident Insurance:** Students will be required to participate each quarter in a health and accident insurance program unless a written request for exemption is submitted to the University prior to registration. Approximate cost of the insurance will be \$6 per student per quarter.

**Excess Registration Fee:** For each excess hour (except two hours of Military Science, Aerospace Studies, or one hour of Physical Education) .....\$10  
Students may register for 19 hours per quarter without paying excess registration fees.

**Automobile Parking Permit:** \$7.50 per year.

**Out-of-State Student Auto Permit:** 50¢

**Late Registration Fee:** \$5 beginning second day after specified Registration Days: additional \$1 for each additional day up to a maximum of \$10.

A student whose check is dishonored by his bank will be charged the late fee in effect when the check is redeemed.

**Change in Course of Study List:** No charge for the first week of the Quarter. \$3 for each change made thereafter.

**Final Deadline for Course Changes:** Course changes, adds or drops, may be made through the third week of the Quarter.

**Special Students—Registration fee**.....\$10  
Plus \$6 per credit hour (maximum 6 credits)

**Visitor Fee—Registration** as listener or visitor in lecture course only in which no credit is desired, per quarter, per subject .....\$10

**Special Examination Fee—Per Credit**  
Hour .....\$4

**Qualifying Examination—Graduate School**  
1 Part .....\$3.50  
2 Parts .....\$5.50

**Graduation Fee** .....\$10  
Late fee of \$2 after January 15.

**Student Teaching Fee** .....\$36

**Teacher Placement Re-registration** .....\$5

**Locker Rental—Fall, Winter and Spring** \$1.50

Fifty Cents of this fee is refunded to students upon returning the key accompanied by receipt, prior to the first Friday following Commencement exercises.

**Transcript of Credits.** Each student is entitled to one transcript free. Additional transcript (Extra copies 25c) .....\$1

Transcripts will not be issued unless the money accompanies the order.

**Progress Report.** Adviser furnishes one copy free. Additional copies .....25¢ to 50¢

**Note fee,** on individual loans .....\$2

**Cap and Gown Rental—**

Bachelor of Science .....\$3

Master of Science .....\$6.50

**Master's Degree Fee** for binding and proofing thesis .....\$5

**College of Humanities and Arts—**Students using the language laboratory equipment are required to pay a fee of \$2 per course per quarter except Summer Quarter, which is \$6.

**College of Business and Social Sciences—**Students using business machines will be required to pay a fee of \$2 per quarter.

**College of Natural Resources—**

Senior Field problems:

Forestry 146 .....\$35

Range 196 .....\$30

Wildlife Management 171 .....\$35

A maximum fee of \$5 per quarter may be charged in any course requiring use of the computer.

A minimum excess breakage fee of \$5 may be required for Laboratory classes.

**Military Uniform Fee** .....\$5

**Music—Individual Instruction** with members of the College Staff:

Nine lessons per Quarter (1 credit) .....\$30

**Music 1 Laboratory Fee** .....\$1

Fees must be paid at beginning of quarter before instruction begins.

Individual instruction with additional authorized teachers is registered for at the college and given like credit, but paid for by private arrangement with the teacher concerned.

**Practice Fees:**

Practice Room with Piano, 1 hour per day per Quarter .....\$2.50

Practice Room without Piano, 1 hour per day per Quarter .....\$1.75

Organ, 1 hour per day per quarter .....\$5

**Speech—**The fee for Speech 112 is \$20 per credit hour per quarter, consisting of 10



private lessons. Authorized instructors are: Burrell F. Hansen, Floyd T. Morgan, Gwendella Thornley.

**Registration is not complete until students have presented the fee card at the Cashier's Window, office of the Controller, and have paid fees, and filed the registration cards with the Registrar's Office.**

**Refunds.** All fees paid, with the exception of the \$10 registration fee, may be refunded to any student in residence who withdraws from school before the end of the seventh week, in proportion that the number of instructional weeks subsequent to withdrawal bears to the number of instructional weeks in the period covered by the fees paid.

**Alumni Fees.** After a student has paid a total of \$30 in Alumni fees he becomes a Life Member of the USU Alumni Association. Graduate Students or students attending more than 12 quarters, and who have been assessed more than the \$30 in Alumni fees, may receive a refund of the excess amount upon sending a written request to the USU Alumni Association within 30 days from the registration day of the quarter in which the additional money was paid.

According to the constitution of the Associated Students, a regularly enrolled student must obtain, at time of registration, a Student Body card which will admit him to all activities controlled by the Associated Students: athletic events—football, basketball, tennis and track—dramatics and musical entertainments, socials, lectures, etc.; will give him a copy of the yearbook if student body fee was paid for all quarters, and a subscription to the University newspaper. The system has been found to be a great saving to the students and an excellent means of fostering proper interest in student activities.

**Information on Scholarships, Fellowships, and Assistantships** can be found in the section on Student Services and Activities in this Catalog.

**For Housing Fees** see Catalog section on Student Services and Activities.

For a more detailed list of **Summer Quarter** fees consult Summer Quarter Catalog.

**University Publications:** General Catalog, \$1; Graduate Catalog, 50c Class Schedule Bulletin, 25c.



# Utah State University Board of Trustees

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## Vice Chairman

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Phillip A. Bullen, *Salt Lake City*

N. D. Salisbury, *Logan*

Alva C. Snow, *Roosevelt*

Orpha S. Boyden, *Salt Lake City*

Roger B. Hansen, *Mount Pleasant*

James S. Prestwich, *Cedar City*

Beverly D. Kumpfer, *Salt Lake City*

R. J. Potter, *Garland*

Snell Olsen, *Spanish Fork*

W. B. Robins, *Salt Lake City*

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Clyde L. Miller, *Salt Lake City*, Secretary of State

M. Ted Karren, *Logan*, President, Alumni Association

## Secretary to the Board

L. Mark Neuberger, *Logan*

# Officers of Administration

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*President Emeritus:* Daryl Chase (Effective July 1, 1968)

*Assistant to the President for Special Projects:*  
Gerald R. Sherratt

*\*Vice President, Academic Affairs:* M. R. Merrill

*Vice President, Research:* D. Wynne Thorne

*Vice President, Business:* Dee A. Broadbent

*President, Snow College:* Floyd S. Holm

*Dean, School of Graduate Studies:* Eldon J. Gardner

*Dean, College of Agriculture:* Vearl R. Smith

*Dean, College of Business and Social Sciences:* Robert P. Collier

*Acting Dean, College of Education:* Oral L. Ballam

*Dean, College of Engineering, and Chairman, Utah Water Resources Center:*  
Dean F. Peterson, Jr.

*Dean, College of Family Life:* Phyllis R. Snow

*Dean, College of Humanities and Arts:* Carlton F. Culmsee

*\*Dean, College of Natural Resources:* J. Whitney Floyd

*Dean, College of Science:* Ralph M. Johnson

*Director, Agricultural Experiment Station:* K. W. Hill

*Director, Extension Services:* William H. Bennett

*Director, Utah Water Research Laboratory:* Jay M. Bagley

*Director, Engineering Experiment Station:* Clayton Clark

*Librarian:* Milton C. Abrams

*Dean, Admissions and Records:* L. Mark Neuberger

*Dean of Students:* Claude J. Burtenshaw

*Dean of Women:* Helen Lundstrom

*Controller:* Sylvan Erickson

*Director, Institutional Development:* Emanuel A. Floor

*Director, Summer Quarter:* Ellvert H. Himes

*Coordinator, Latin American Affairs:* B. Austin Haws

*Director of Athletics:* Frank Williams

*\*Term of office expires June 30, 1968*

# Departments of Instruction

Department	Head	Office Building
Accounting	Norman S. Cannon	Main 131
Aerospace Studies	Roland H. Taylor	Military Science 107
Agricultural Economics	N. Keith Roberts	Ag Science 230
Agricultural Education	Von H. Jarrett	Ag Science 110
Agricultural and Irrigation Engineering	A. Alvin Bishop	Engineering C-213
Animal Science	James A. Bennett	Animal Industry 201
Applied Statistics and Computer Science	Rex L. Hurst	Main 14
Art	Harrison T. Groutage	UA 205A
Audiology-Speech Pathology	Samuel G. Fletcher	Mechanic Arts 202
Bacteriology, Public Health	Rex S. Spendlove	Plant Industry 310
Botany	Orson S. Cannon	Plant Industry 204A
Business Administration	Howard M. Carlisle (acting)	Main 133A
Business Education and Office Administration	Ted Ivarie	Main 347
Chemistry	Melvin C. Cannon	Widtsoe 112
Civil Engineering	Elliot Rich	Engineering L-162
Clothing and Textiles		Family Life 303A
Dairy Science	George E. Stoddard	Animal Industry 106
Economics	Reed R. Durtschi	Main 322
Educational Administration	Homer M. Johnson	Education 206C
Electrical Engineering	Larry S. Cole	Engineering L-150
Elementary Education	E. Malcom Allred	Education 204
English and Journalism	T. Y. Booth	Library 416
Family and Child Development	Don C. Carter	Family Life 215D
Food and Nutrition	Ethelwyn B. Wilcox	Family Life 111
Food Science and Industries	C. A. Ernstrom	Animal Industry 212
Forest Science	Ross S. Whaley	Forestry and Zoology 1
Geology	Clyde T. Hardy (acting)	Main 258
Health, Physical Education and Recreation	H. B. Hunsaker	Gym 306
History	S. George Ellsworth	Main 317-H
Homemaking Education	Virginia H. Harder	Family Life 318
Household Economics and Management	Edith Nyman	Family Life 314B
Industrial and Technical Education	Neill Slack (acting)	Mechanic Arts 104
Instructional Media and Library Science	Lester C. Essig	Education 113
Landscape Architecture and Environmental Planning	Burton Taylor	Main 1
Languages and Philosophy	Austin E. Fife	Main 212
Manufacturing Engineering	Carl D. Spear	Mechanic Arts 126
Mathematics	Neville C. Hunsaker	Engineering C-327
Mechanical Engineering	Reynold K. Watkins	Engineering L-178
Military Science	Owen W. Owens	Military Science 102
Music	Max F. Dalby	Fine Arts 109
Physics	W. Farrell Edwards	Engineering L-154
Plant Science	Frank B. Salisbury	Ag Science 322
Political Science	M. Judd Harmon	Main 250
Psychology	Heber C. Sharp (acting)	Education 301
Range Science	L. A. Stoddard	Forestry and Zoology 1
Secondary Education	Kenneth Farrer	Education 206B
Sociology, Social Work and Anthropology	Therel Black	Main 234
Soils and Meteorology	R. L. Smith (acting)	Ag Science 148
Special Education	Kaye D. Owens (acting)	Education 301
Speech	Rex E. Robinson	Main 33
Theatre Arts	Twain Tippetts (acting)	Fine Arts 232
Veterinary Science	Merthyr L. Miner	Veterinary Science 104
Wildlife Resources	William F. Sigler	Forestry and Zoology 1
Zoology	Datus M. Hammond	Forestry and Zoology 16

## Explanation of

# Catalog Numbering System: Courses, Quarters, Credits

USU operates on a quarterly system—four quarters or periods of classwork: Fall, Winter, Spring, and Summer. Each quarter is of ten to twelve weeks duration. Summer Quarter is divided into two sessions, first and second. The other three quarters are not so divided.

Most classes give either one, two, three, four or five credits for successful completion of the course. As a general rule, a class is attended the same number of times per week as the credits offered. For example a three-credit class generally meets three times a week; a one-credit class, once a week; a five-credit class, five times a week.

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:

### 4. Elements of Grammar.

This means the course, Elements of Grammar, is English 4. The numbers are useful for reference and records.

**Courses numbered 1 through 99 are Lower Division courses;** that is, courses ordinarily taken either the Freshman or Sophomore year. **Courses numbered 100 through 199 are Upper Division courses;** that is, courses ordinarily taken either the Junior or Senior year. **Courses numbered 200 or above are Graduate courses;** that is, courses taken by Graduate students.

**A Freshman or Sophomore may take any Lower Division course.** If there is a prerequisite for a particular course, it will be so stated in the course description. He may take an Upper Division course if he obtains in advance the consent of the instructor and his adviser.

**A Junior or Senior may take any Lower or Upper Division course.** Any prerequisites to a course will be mentioned in the course description. He may take certain Graduate courses if he obtains in advance the consent of the instructor and his adviser.

**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, the quarter/s it will likely be taught, and the name of the instructor. 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. (5F, W, Sp, Su) indicates that the course offers five credits and will likely be taught all four quarters: Fall, Winter, Spring, and Summer. It *does not* mean that a student has to take the class all four quarters, but rather that he has his 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



## 12 *Utah State University*

given each quarter, but only one of these quarters, the exact one yet to be decided.

**For more definite, up-to-date information, one should refer to the Class Schedule published early in the fall. It contains the schedule for the Fall, Winter, and Spring Quarters.**

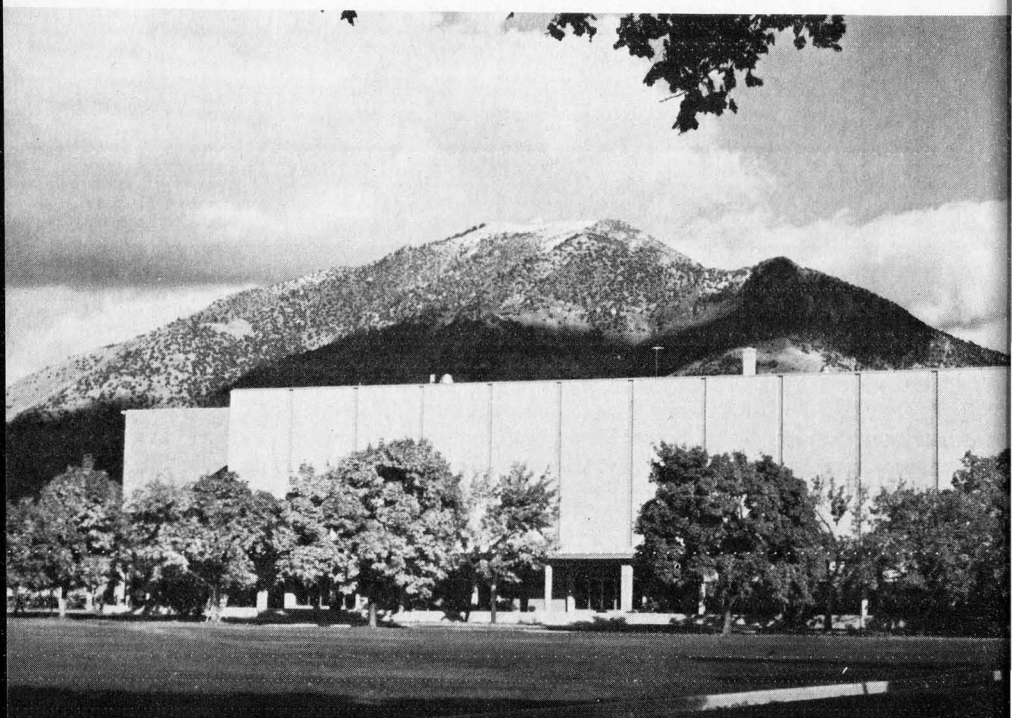
All Catalog listings are subject to change.

Occasionally two or more closely related courses will be listed under one entry, such as English 1. 2. 3. **Freshman English.** The credit entry will read: (3F, 3W, 3Sp). That means that each of the three courses, 1., 2., and 3., offers three credits.

Where a single course, for example Music 133. **Choir.** has such an entry: (1F, 1W, 1Sp) it indicates that the same course may be taken for credit more than just one quarter. Choir, for example, could be taken all three quarters, giving one credit each quarter. Such courses, however, are the exception. The great majority of courses can be taken only once for credit.

In some classes the amount of credit for which students register can be individually arranged. One student may take two credits, another student three credits, etc. On such courses the notation appears (Cr. Arr.), meaning the credit is individually arranged, between student and instructor, the amount of credit depending upon the amount of time and effort one wishes to devote to it. Five is the maximum number of credits that can be earned except for a thesis course or unless otherwise specified.

Preceding the number of some courses will be either a single asterisk (\*) or a double asterisk (\*\*). Such courses are taught only on alternate years. Those with a single asterisk are taught during the current catalog year; those with a double asterisk are taught the following year. Again, it should be remembered that this may only be tentative; it is well to check the Class Schedule or to consult the course instructor or department head for verification.





*LIBRARY*

# University Library

**Librarian** Milton C. Abrams; **Assistant to the Librarian** Michael J. Clark; **Social Science and Education Librarian** La Dell Hoth; **Science and Engineering Librarian** Ida Marie Logan; **Documents Librarian** Karlo K. Mustonen; **Public Services Librarian** Burdette A. Peterson; **Special Collections Librarian** A. Jeffery Simmonds; **Anne Carroll Moore Librarian** Anna M. Smith; **Humanities and Arts Librarian** J. Mark Sorensen.

Main Office in Room 125 Library

During the past ten years the USU Library collection has been expanded from 189,000 to more than 500,000 volumes to keep pace with rapidly growing University programs of teaching, research, and service. Annual subscriptions to periodicals have now passed the 5,000 mark, and the micro-materials collection includes more than 75,000 titles. Of special note to the student and researcher are 173,000 volumes and items that make up the public documents collection, and large holdings of rare books and other special collections.

All library services reflect the latest thinking in library science, including open stacks adjacent to reading areas, divisional organization of materials, and automated circulation control.

The library collection is organized into five subject-matter divisions: Science and Engineering; Social Science, Business and Education; Humanities and Fine Arts; Public Documents; and Special Collections. There are two service divisions, Public Services and Technical Services, and a collection of children's books is housed in the Edith Bowen Laboratory School.

The library building is new, having been completed in 1967. It is a massive but beautiful glass, brick, and concrete structure. Interior space totals 200,000 square

feet. This includes four floors and the basement. It is fully air-conditioned and has fluorescent lighting throughout. The spacious reading rooms, group study and seminar rooms, faculty study cubicles, and graduate student study carrels, are furnished with the latest in contemporary furniture. Present seating capacity is 1,200 and maximum is 2,400. The building is designed to house a maximum book collection of one million volumes.

## Divisions of the Library

A) **Science and Engineering.** This division houses both the journal and book collections to serve the Colleges of Science, Engineering, Agriculture, Family Life, and Natural Resources.

B) **Social Science, Business and Education.** Within this division of the Library are located the library materials which support the programs offered by the College of Business and Social Sciences and the College of Education.

Included within this division is a special library composed of curriculum materials, textbooks and guides, used in the elementary and secondary schools. Although useful to the other colleges, this program is designed primarily to assist the College of Education in teacher preparation.



**C) Humanities and Fine Arts.** The Division of Humanities and Fine Arts consists of the books and serials that support the departments which make up the College of Humanities and Arts. In addition, the College of Humanities and Arts is responsible for the Liberal Studies program which in turn uses a high percentage of the collection housed in the Humanities Division.

**D) Public Documents Division.** Utah State University Library is a regional depository of the United States Government Publications. It receives all government publications designated as depository items. In addition to depository items, the Division houses such special government research report series as Joint Publications, Research Service Publications, Office of Education Cooperative Research Reports, National Aeronautics and Space Administration Publications, and U.S. Government translations in selected subject areas. The Library can also draw upon the services of many government information services such as those offered by the Library of Congress, National Library of Medicine, and the National Referral Center for Science and Technology.

**E) Special Collections Division.** The Special Collections Division of the University Library has been

created to meet the needs of a continually expanding collection of a variety of related materials. The library is in possession of a sizable collection of works which fall into the following categories: first-edition collections of literary authors, rare books, notable authors' complete works, local histories, diaries, manuscripts, Utah State University Archives, and collected works of a special nature. These materials have been acquired over the period of years of the existence of the Library by gift, purchase, and publication by the University. A program is being planned to vigorously pursue the acquisition of further materials for these collections.

### Children's Library

**The Anne Carroll Moore Library** in the Edith Bowen Elementary School is a special collection of children's books and a working laboratory for the training school.

### Resources of the Library

a) Approximately 550,000 volumes; b) 6,000 periodical subscriptions; c) Regional Depository for United States Government documents; d) Selective depository for United Nations publications; e) Exchange holdings of state, territorial, and foreign documents; f) A growing collection of documentary micro-films and micro-cards.





*ADMISSIONS AND RECORDS*

Office of

## Admissions and Records

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## Office of

# Admissions and Records

**Dean L. Mark Neuberger; Records Officer Asa L. Beecher; Admissions Counselor Thelma B. Waddoups.**  
Office in Main 104

The Office of Admissions and Records is the official guardian of all permanent academic records of the University. It performs the following academic services:

1) **Admission of Students:** Interviewing prospective students; evaluation of freshman credentials; evaluation of advanced standing credentials; processing permanent records; student deferments; reports to government agencies.

2) **Registration:** Preparation of registration material (packets);

registration procedures.

3) **Records:** Processing registration material; course changes; recording grades; progress reports; transcripts; microfilming.

4) **University Records.**

5) **Scheduling:** Schedule bulletin; assignment of rooms; record of approved courses.

6) **Graduation:** Checking and summarizing graduation requirements.

7) **Veterans' Affairs.**

8) **Statistics:** Periodical reports; special reports.

## Admission: Entrance Requirements

Admission to Utah State University is granted upon the basis of an official application which includes transcripts of credit from schools previously attended. The Uniform Application for Admission to Utah Collegiate Institutions may be obtained upon request from any Utah high school principal, or from the Office of Admissions and Records of Utah State University.

Students will not be permitted to register until all admission requirements have been met, including payment of a \$10 nonrefundable application-evaluation fee.

Applications for admission and credentials from schools previously attended *must be received not later than September 1 for Fall Quarter; December 1 for Winter Quarter;*

*March 1 for the Spring Quarter; and May 1 for Summer Quarter.*

The standard minimum requirement for admission to any college of the University is graduation from an approved high school in the United States or equivalent training in any country whose educational systems differ from that in the United States.

**Testing.** All freshmen, including transfer students with less than 45 credits and all other transfer students who have not completed one full year of freshman English, must present the results of the American College Testing Program Examination (ACT) as part of their application for admission to the University.

Test scores may be used as one of

the criteria for admission, and they are always used to assist deans, heads of departments, and advisers in placing students in appropriate class sections, advising them concerning course loads, and in helping them with other similar academic decisions. *Therefore, test results must be part of the students' application records before they will be issued permits to register.*

Testing dates and general information about the ACT Examination may be obtained from high school counselors or by writing to ACT Central Registration Unit, 519 West Sheridan Road, McHenry, Illinois.

In addition to the ACT Examination, new students may be required to complete other types of testing after they arrive on campus. Notification of such specialized tests will be given at Freshman Orientation.

**Graduates of Utah high schools** will be admitted to the University if they are entering Utah State directly from high school. Students with grade point averages between 2.0 and 2.2 will be referred to the dean of the college of their choice for consideration. If the dean accepts such students, they will be placed on warned status or probation. Students not acceptable to a college will be admitted to general registration, but such students will be placed on warned status or probation.

**Graduates of non-Utah high schools** will be accepted in full standing if they present a grade point average of 2.2 or above and are entering Utah State directly from high school. Students who present a grade point average below 2.2 will be referred to the Admissions Committee and will be accepted or rejected on the basis of approved test scores and other

information. Required test scores must be provided by the student.

Admission to the University does not imply permission to register for any course for which there is insufficient preparation. Deans and department heads may require prerequisites for certain courses. Students at USU are expected to demonstrate in all classes that they have adequate general preparation for college study, apart from particular prerequisites for particular courses. Especially will the student be held responsible 1) for the ability to read and adequately interpret assigned material; 2) for the ability to take accurate notes on lectures; 3) for the ability to write examinations and papers expressing in acceptable syntax and organizational form with proper attention to punctuation, spelling, and other mechanics, the student's own thoughts and those gained from lectures and readings; and 4) for the ability to perform the ordinary arithmetical calculations taught in all elementary and secondary schools. The instructor of a class in any subject may fail or penalize in lesser ways a student for inadequate performance in these basic skills.

A candidate for any degree or diploma from any of the colleges of the University must include among the units presented those preparatory courses specified as prerequisites to beginning University courses in the various fields. Students are urged to give serious thought to the selection of a major field of interest. In this regard, they, in cooperation with parents, high school principal or other school adviser, should plan their school program so as to meet the specific requirements for admission. Failure to do this may delay starting work at Utah State University until the prerequisite courses are made up. Not all of the colleges and departments of

the University have specified prerequisites, but those which do have listed them in their college and departmental sections in this catalog.

**Even though a student is not a high school graduate**, if he is over the age of 18, he may be admitted by presenting satisfactory evidence of ability to do university work. This evidence may be demonstrated by scores on the American College Testing Program (ACT).

#### **Division of General Registration.**

General Registration is the division into which students may be admitted who do not qualify for enrollment into one of the academic colleges. These include Utah residents who have graduated from high school with less than a 2.2 grade point (and are not accepted in an academic college), non-Utah residents and transfer students from other institutions of higher learning with less than a 2.2, and former USU students with less than a 2.0 grade point seeking readmission. Except for Utah residents seeking admission for the first time, admission into General Registration is by permission of the Admissions Committee. First quarter Freshmen students admitted into the division of General Registration will be required to enroll for the non-credit "How to Study" course. Non-credit remedial courses of English and mathematics will be required of students whose American College test scores show deficiencies in those subjects. (See "Low Scholarship and Probation.")

Acceptance by the Office of Admissions and Records does not automatically guarantee housing accommodations. Application for University housing should be made to the Student Housing Office, Main 105, or, in the case of LDS accommodations, to David O. Mc-

Kay Student Living Center, 10th North and 13th East, Logan.

**Advanced Placement.** USU participates in a program of Advanced Placement with students who graduate from high school and present Advanced Placement Examinations under the following conditions:

1) Students may receive 12 credits and advanced placement for a composite score of 5, 4, or 3 on any Advanced Placement Examination taken at the completion of a full year course, with class meetings held each day of the school year, organized according to the description published by the Committee on Advanced Placement of the College Entrance Examination Board.

2) Students who present a composite score of 2 on both parts of an Advanced Placement Examination taken at the completion of a full year course, with class meetings held each day of the school year, organized according to the description published by the Committee on Advanced Placement of the College Entrance Examination Board, may be given consideration for Advanced Placement with credit, Advanced Placement without credit, or neither of the above.

3) USU will recognize Advanced Placement with credit only for those areas which have been established by the College Entrance Examination Board. The basis of consideration shall be the Standardized College Entrance Examination Board Advanced Placement Test.

#### **Transfers from other Colleges.**

The University does not grant collegiate credit for high school work in excess of graduation requirements. Transcripts of credit must accompany applications for admission when submitted by students who have attended other collegiate institutions. Transcripts

submitted for evaluation become the property of the University, and are not returned. *A student who fails to submit transcripts from all institutions previously attended is liable to suspension from the University.*

Credit will be granted for work completed, with satisfactory grades, in other accredited institutions except for credit earned by special examination. Transferred credit may be accepted for filling specific requirements if satisfactory evidence is presented that the work completed is equivalent to the work to be substituted.

The University accepts transfer credit from junior college programs up to and including 108 credits. A transfer student who presents an associate degree from an accredited Utah junior college, will be considered to have fulfilled the institutional group requirements. (Some curricula, as in the professional colleges, do not include these group requirements.) He must still comply with the specific requirements of the college and major department in which he expects to earn his Bachelor's degree and must complete not fewer than 60 credits of upper division work.

Students who transfer to USU after having had one or more quarters of college work at another accredited institution will be accepted in good standing if they have a cumulative grade point average of 2.2 or better.

Students who have a cumulative grade point average between 2.0 and 2.2 will be referred to the dean of the college of their choice for admission to that college. If unacceptable to the dean of the college, such students will be admitted to general registration if they have earned fewer than 135 credits.

Exceptions may be made by the Admissions Committee. ACT test scores, the recommendations of counselors, and the student's experience in non-academic pursuits will be considered. Students who have a grade point average below 2.0 will be admitted only upon recommendation of the Admissions Committee.

All subjects taken, whether in high school or in college, will be considered in determining the eligibility of students applying for admission to Utah State University. The Office of Admissions and Records will establish the grade point in all questionable cases.

**Readmission.** Former students of the University returning after an absence of one or more quarters are required to file applications for readmission not later than September 1 for Fall Quarter, December 1 for Winter Quarter, March 1 for the Spring Quarter, and May 1 for Summer Quarter.

**Exception.** Students who were in attendance the previous Spring Quarter are not required to reapply for Fall Quarter unless they have been suspended.

## Registration and Credits

**Credits.** A "credit" is given for one hour of lecture or three hours of laboratory work each week for 12 weeks.

**Class Standing.** Forty-five cred-

its of approved college work in addition to the prescribed entrance requirements are required for Sophomore rank; 90 credits for Junior and Upper Division rank;



and 135 credits for Senior rank. These figures include the required credits in Physical Education, Military Science, or Aerospace Studies.

**Assignment of Adviser.** When students have been admitted to USU and have indicated their proposed major field of study, their name is forwarded to the dean of the college concerned. He will assign an adviser who will assist in registration and vocational planning. Students remain with the same adviser throughout their university program unless in consultation with their dean a new adviser is assigned or unless their major field is changed.

**Registration.** On each registration day, students are permitted to register according to an alphabetical schedule to be announced later.

Details of pre-registration procedures will be announced later.

In case a student cannot call for his registration materials at the hour scheduled for their release, he may receive them at a later hour. But in fairness to other students, registration materials cannot be released earlier than the time scheduled. Observance of this fact and respect for the rights of others will greatly facilitate registration procedures for all concerned.

*Registration is not complete until the fee card is presented at the cashier's window, Office of the Controller, and fees have been paid and registration cards filed with the Office of Admissions and Records.* Students will not receive credit for resident work unless they are officially registered for the specific courses involved.

The program of courses listed on the registration card, approved by the dean and filed in the Office of Admissions and Records, is the official registration for the quarter. Students are held responsible for the satisfactory completion of the

entire program unless an official change-of-registration form is filed with the Office of Admissions and Records. An "F" grade will be recorded in case of failure to obtain a passing grade or an incomplete in any course for which students are registered, regardless of the reason for the failure.

**Penalties for Late Registration and Late Registration Fee.** \$5 beginning the second day after specified registration days; additional \$1 for each additional day, up to a maximum of \$10.

The amount of work for which students are allowed to register will be reduced by one and one-half credits for each week, or fraction thereof, that they are late in registering.

**Changes in Registration.** Any change in original registration, deletions or additions, must be recorded and appropriately approved on the official change-of-registration form.

During the first three weeks of any academic quarter, registration may be changed on the student's own initiative. *He may add classes up to and including the end of the second week of each quarter, and he may be permitted to drop classes up to and including the end of the third week of each quarter*—by obtaining the approval of the teacher concerned, the faculty adviser, and the dean of his college, so indicated by their signatures on the change-of-registration form. (These forms are available at the Office of Admissions and Records.)

The dean of the college in which a student is registered considers each case on its merits. The signature of approval from the dean, in addition to the signatures of the instructor and the adviser, must appear on the change-of-registration form before it is accepted at

## 24 *Admissions and Records*

the Office of Admissions and Records.

After the third week, changes in registration may be made only for extraordinary reasons beyond the control of the student and upon initiation of the dean of the college in which the student is registered. Students who have valid reasons for changing registration after the third week should discuss them with the dean. Students who withdraw or drop a class after the third week of the quarter, will have grades of WF (failing) or WP (passing) recorded on their official records.

In the event students register for a class which is later cancelled, it is the responsibility of the teachers to notify the Office of Admissions and Records so that the students may be properly withdrawn from the class.

**Change-of-Registration Fee.** No charge for the first five days (after changes are permitted); \$1 for each class change made thereafter.

### **Withdrawal from the University.**

1) Obtain withdrawal forms from the Office of Admissions and Records. 2) Report to the Office of Student Services for termination interview. 3) Obtain the following signatures on Withdrawal Interview Record card: a) faculty adviser, b) dean of college. 4) Take Withdrawal Permits and Withdrawal Notice to the Office of Admissions and Records. 5) Take Withdrawal Notice to Controller's Office for refund.

**Visitor's (Auditor's) Permit.** If students wish to attend regularly any class for which they are not registered, they must obtain a visitor's permit from the Office of Admissions and Records. No credit will be allowed for such attendance and a fee of \$10 per class is charged. The official forms, properly executed, must be submitted to

the Office of Admissions and Records before attendance at a class is permitted.

**Importance of Submitting Forms to the Office of Admissions and Records.** The special change-of-registration form, properly executed, must be filed at the Office of Admissions and Records before any change becomes effective. Withdrawal from a class without adhering to the regulations specified above and before the deadline makes it mandatory upon the instructor and the Dean of Admissions to record an "F" grade. Attendance at classes without proper approval and without official registration as defined above, and before deadline as specified above, will result in forfeiture of any credit for such attendance.

**Responsibility of Instructors.** Instructors are charged with the responsibility of denying students the privilege of attending classes if they have not complied with regulations for admission to classes.

**Normal Registration.** Fifteen credits, exclusive of two credits in basic Military Science or Aerospace Studies or one credit in Physical Education, is the normal registration for any quarter.

**Maximum Registration.** The student's adviser and dean of the college in which he is registering must approve his registration regardless of the amount of credit. Whether it should be lower or higher than "normal registration" will depend upon several factors, such as parttime employment, extracurricular activities, the student's capacity or aptitudes, his amount of preparation for specific courses, and his degree of progress or scholastic status. A student is not allowed to register for less credit than that listed for a course in order to bring the total registration

within the maximum limit as herein defined. No credit arranged may exceed five credits unless otherwise specified. The registration is construed to include any extension, correspondence, institute, or other work carried for credit, or for removal of high school deficiencies, during the period of the school year.

**Minimum Registration for a Fulltime Student.** The minimum registration for a fulltime student load is considered to be 12 credits. To be eligible for studentbody offices students are required to be registered for 12 credits or more. Veterans are required to be registered for 14 credits or more to qualify for full subsistence. Students deferred by the Selective Service System under II S classification should complete 25% of the total number of credits required for graduation each academic year (September through August). Students in five-year courses should complete 20% of the total each year. **Note:** Students who take more than six credits will be charged full fees for the quarter. (See pages 6 and 7 on Special Fees.)

**Incomplete Work.** Students are required to complete by the end of the quarter all courses for which they have registered. This includes correspondence courses for which a student may be concurrently registered. Incomplete grades can be granted by an instructor only when permission is granted by the dean of the college in which the course is offered before the close of the quarter. The necessary petition form may be obtained at the Office of Admissions and Records or the dean's office. Incomplete work must be finished, and a passing grade given in the course, within one year of the close of the quarter; otherwise the "Inc." will be changed to a grade of "F."

### **Low Scholarship and Probation.**

A student shall be placed on warned status at the end of the quarter in which his total grade points earned are 8 points less than would be required for a 2.0 grade average. He shall remain on warned status until his average cumulative grade is raised to or exceeds 2.0.

A student shall be placed on probation at the end of the quarter in which his average grade is less than 1.01 or his total number of grade points earned is 16 or more points less than would be required for a 2.0 grade average. A student shall remain on probation until his average cumulative grade is raised to or exceeds 2.0. Following the quarter for which a student is placed on probation, **he shall be notified of his status by a letter from his academic dean in which he shall be instructed to visit his adviser before the end of the fifth week to sign a statement by which he acknowledges the terms of the probation. The signed statements shall be collected in the academic dean's office.**

A student on probation shall be suspended at the end of the quarter in which his average grade for the quarter is less than 2.0, unless his average cumulative grade is 2.0 or above, in which case he shall remain on probation.

A suspended student may be considered for retention by the Appeals Committee at the recommendation of the student's academic dean. A student who feels that certain extenuating circumstances precipitated his low scholarship, and who can show some evidence that he may do better academically in succeeding quarters, may petition his academic dean for permission to continue in the General Registration Unit without the intervening one quarter discontinuance. In the event

that a student is granted permission to register, he must register in the General Registration Unit, and will be considered on a probationary status.

After a student who has been dropped for low scholarship has been out of the Institution for one quarter or more, he may apply for re-admission. Such application is made to the Admissions Committee. If permitted to register, he may register in the General Registration Unit on probationary status.

A student on probation in the General Registration Unit who does not maintain a "C" average may be denied permission by the Admissions Committee to re-register in that unit. In such cases the Chairman of the Admissions Committee will recommend to the President that the student seems unable to profit from the University experience and should be dropped from the University.

If a student is admitted on "warned" status and fails to maintain a satisfactory grade point average for two quarters, he may be suspended at the end of the second quarter. Students who are admitted on probation may have only one quarter in which to remove probational status.

Students in the low scholarship group may not register for more than 15 credits per quarter exclusive of one hour of Physical Education, or two hours of Military Science or Aerospace Studies.

**Credit by Special Examination.** In special cases, students may be permitted to obtain university credit by passing examinations in

subjects not taken in classes. Credit for a subject taken in a course for which a grade other than passing has been received cannot be acquired by means of special examination. This privilege does not permit the combination of "visiting" or "auditing" a class with a request for a special examination as a means of acquiring credit. Neither does it contemplate outside assignments or outlines on the part of the instructor being combined with an examination to acquire credit. This privilege is intended to measure information and training gained from practical experience that may be considered the equivalent of the experience and training received by students in an organized course given in the University.

A maximum of 18 credits can be acquired by special examination. None of the last 30 credits presented for a Bachelor of Science degree may be obtained in this manner. Unless the examination is taken prior to the close of the second week of any quarter for which a student enrolls, the credits gained will be included as part of the load for the quarter.

Special examinations are given only to students regularly registered in residence at the time the request for examination is made.

Credits earned by special examination cannot be used for satisfying the requirements for a graduate degree nor for certification.

Request for permission to take special examinations should be made to the Office of Admissions and Records.

# Registration Procedure

**Step 1. Obtain Registration Packets** in the reserved seat section in the south end of the Fieldhouse. Students who were not here for the previous quarter and who have not made application for admission must go to the Office of Admissions and Records in the Main Building, Room 104.

**Step 2. Fill Out Trial Study List.** Proceed to the tables provided and fill out all data called for on the registration card, including the listings of the courses if your proposed program of courses has been approved by your faculty adviser.

**Step 3. Consult Faculty Adviser.** Proceed to the basketball floor in the Fieldhouse, where the faculty of the college division in which you are registering will assist students. Signs will direct you to the various sections reserved for the college divisions. New students who have not been assigned to a faculty adviser will go directly to their deans for this assignment. Students who have received their assignments to a faculty adviser will go directly to their adviser.

**Step 4. Obtain Approval of Your College Dean.** After your program of studies has been approved by your faculty adviser.

**Step 5. Obtain Class Roll Cards** for all classes on your registration card. Class roll cards for classes that require approval

of instructor (designated by "T" after title) will be obtained from the teachers concerned. Class roll cards for all other classes will be obtained from the departments concerned at the tables situated at the north end of the Fieldhouse. The class card will be turned in with the packet. It is important that these class roll cards be turned in to the Office of Admissions and Records on registration day. Official class lists will be prepared from these cards and sent to teachers. Students whose names do not appear on the official class list will be liable to suspension.

**Step 6. Have Registration Packets Checked** at the Admissions and Records' checking tables in the north end of the Fieldhouse.

**Step 7. Obtain Fee Assessment Card** from the fee card table.

**Step 8. Pay Fees at Cashier's Window, Main Building 120.**

**Step 9. Return Registration Packets** to the Admissions and Records' table in the Main Auditorium, Main Building. **Registration is not complete until packets have been turned in.**

**Veterans and War Orphans** receiving educational benefits should stop at the Veterans Office, Main 111, before turning in packets. Training benefits payments begin on the day that registration is completed. **Late registration is expensive.**



## Lower Division Requirements

The Lower Division is composed of courses taken in the Freshman and Sophomore years. The main purposes of this division are to provide a broad and integrated background in the principal fields of human knowledge, and to prepare for the major work upon which a student will concentrate in the Junior and Senior years.

Provision is made in several departments for the issuance of Certificates of Completion for two years of work as prescribed by these departments.

To become a candidate for the Bachelor of Science degree a student should plan courses with great care through consultation with faculty adviser, major professor, and dean.

To complete the work of the Lower Division the following requirements should be satisfied:

**I.** Complete 90 credits of work with an average of "C" or higher.

**II.** Prepare a foundation of at least 15 credits for the field of specialized study in the Upper Division.

**III.** Completion of Basic Communication (English 1, 2, 3) or equivalent. Beginning Freshmen are required to take Basic Communication 1 and to continue through Basic Communication 2 and 3. Students who enter with transfer credits should consult with the English Department concerning the Basic Communication course that they may be required to take.

Enrollment for Basic Communications may be waived or deferred by agreement between the student's academic dean and the head of the English Department, if extenuating circumstances exist. Withdrawal from enrollment in a

Basic Communications course may be authorized by the same procedure. Special students (those registering for 6 or fewer credits) need not register for BC. Such waiver or withdrawal does not affect the BC requirements for graduation.

Note: For graduation all students must present 9 credits in Basic Communication or its equivalent.

**IV.** A minimum of 43 credits must be completed in general education distributed according to the following plan:

**A. Natural Sciences:** 18 credits selected from the following:

**Biological Sciences** (5 credits required) Biology 1, 15; Bacteriology 10, 70; Botany 26; Entomology 13; Physiology 4; Zoology 16.

**Physical Sciences** (5 credits required) Chemistry 20, 21, 22, 10, 11, 12, 31; Geology 1, 3, 4, 31; Mathematics 20, 30, 34, 35, 44, 46, 97; Meteorology 17; Physics 3, 6, 10, 17, 18, 19, 20, 21, 22, 60.

Note: At least one course must include a lab.

No more than five credits of Mathematics can count toward fulfillment of this group.

If a student can demonstrate adequate preparation, permission can be obtained to use more advanced courses to fill this group requirement.

**B. Social and Behavioral Sciences:** 10 to 15 credits. Credits must be selected from at least two of the following department offerings:

Agricultural Economics 71, 72, 73 (not more than three credits to apply); Economics 51, 52, 150, 170,

180; Geography 1; History 1, 2, 3, 4, 5, 20; Political Science 1 or 10, 101, 102; Psychology 53; Sociology 10 or 70; Anthropology 90.

**C. Humanities:** 10 to 15 credits. Credits selected from at least two of the following areas with a maximum of eight credit hours in any one area:

**Art**—1, 10, 35, 36, 37, 38, 40.

**English**—Any literature course of Lower Division; any literature course of Upper Division with the approval of the instructor of the course.

**Family Life**—Food and Nutrition 22, Clothing and Textiles 5, 75, Household Economics and Management 149, Family and Child Development 20, 67.

**Landscape Architecture**—3.

**Languages**—1) Any Upper Division foreign language course, with the approval of the instructor. 2) A maximum of five credits in any Lower Division language course.

**Music**—1, 101, 102, 103, with the approval of the instructor and department head. A maximum of three credits may be drawn from the following: Music 25, 125, 26, 126, 27, 127, 33, 37, 137, 77, 78, 79.

**Philosophy**—Any lower division course; any upper division course with approval of the instructor.

**Plant Science**—118.

**Speech**—1, 4, 16, 21, 24, 81; also 105, 110 and 113 with the approval

of the instructor and department head.

**Theatre Arts**—1, 2, 10; also 100, 102, 104 with approval of the instructor and department head.

A minimum total of 25 credits is required in Humanities and Social and Behavioral Sciences.

Note: Some majors such as Engineering and Education have recommendations and modifications to these requirements. Students interested in these majors should refer to the description of the intended major in this catalog.

**V. Physical Education.** All students under the age of 31 are required to complete three quarters of Physical Education. Men may meet this requirement by taking Aerospace Studies or Military Science. This requirement should be completed by the end of the sixth quarter of residence work. The required courses are Physical Education 1, 16 or 52 and one course selected from the following activity groups: Aquatics, Dance, Dual Activities, Team Activities, Individual Activities.

If a student takes and passes the waiver tests administered by the Physical Education Department, he may select one course from three of the five activity groups listed above in lieu of the required courses.

**Note:** Classes used to satisfy the above requirements are not to be counted toward the major or minor.

## Upper Division Requirements

Sixty credits of Upper Division work are required for graduation. The completion of the group requirements in any accredited collegiate institution having a similar pattern of general education will substitute for the completion of the group requirements at this institution, as prescribed in the section *Lower Division* above. This does not apply to students who have been pursuing prescribed courses which do not include the group requirements. If they change from a prescribed course to a major under the group elective system, they must complete the basic group requirements as specified in the section on the Lower Division. Transfer students who continue in a prescribed course will be held for the completion of the Lower Division courses as prescribed at USU, except as equivalent courses may be accepted as substitutes for our own courses.

A Freshman or Sophomore may register for Upper Division classes and receive credit toward senior college requirements, if such courses are recommended by his adviser and approved by the instructor. Courses so taken will count in the 60 credits of Upper Division 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 in the Upper Division. As soon as the major subject has been selected, he should consult the head of the department in which he has decided to major. The head of the department will assign an adviser. Registration in each succeeding quarter should be carefully checked and approved by the adviser (called the major professor) to assure

proper selection and sequence of courses for satisfying institutional and departmental requirements.

Major departments have the authority to prescribe not fewer than 30, and not more than 50, credits in the major subject (exclusive of any courses which may have been used to satisfy Lower Division requirements in any of the groups). Major departments and the deans of the colleges shall also prescribe such other related courses as may be considered desirable, provided that free electives are not reduced below 36 credits.

Special consideration is granted students who pursue prescribed pre-medical, pre-dental, pre-veterinary, pre-osteopathy, pre-legal, and child development programs for three years at this University. If students successfully pursue further prescribed work in one of these fields for an additional year at an approved institution, they may be granted a Bachelor of Science degree by this University. Students need not comply with general major-minor requirements as previously outlined.

**Minor Subjects.** Students are permitted to choose their own minor. The minor consists of 18 credits either in one department or in two departments closely related in subject matter, provided that a minor taken in more than one department has the approval of the dean and the major professor.

Courses used to satisfy the English composition, the basic groups, Military Science, Aerospace Studies, or Physical Education, and Freshman orientation requirements as specified under the Lower Division, cannot be counted in the minimum 30 credits for a major or 18 credits for a minor.



# Graduation Requirements

**The University offers Certificates of Completion** for two years of study in certain departments; 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 Business Administration, Master of Education, Master of Fine Arts, Master of Forestry, Master of Industrial Education, Master of Landscape Architecture, Master of Music, Civil Engineer, Irrigation Engineer, Specialist in Educational Administration, Doctor of Education, and Doctor of Philosophy; and gives work to fulfill the requirements for all professional certificates issued by the State Board of Public Instruction.

**The University reserves the right to change at any time the requirements for graduation**, and candidates for a certificate, a diploma, or a degree, are held to compliance with such changes, so far as the uncompleted part of the course is affected.

Students are expected to familiarize themselves with institutional rules and regulations. The responsibility for satisfying the requirements for graduation rests upon them.

If students do not graduate in the class with which they entered, they are held to the requirements, including entrance, of the class with which they do graduate.

## Two-Year Certificates

The Colleges of Agriculture, Engineering, and Humanities and Arts offer two-year courses in practical studies leading to a Certificate of Completion for those who are not interested in the regular four-year course leading to the Bachelor's degree.

In most cases the courses are arranged so that, at a later date, the four-year course can be completed with a minimum loss of time. While these short courses are designed to develop a broader understanding of the science underlying these fields and to lay the foundations for good citizenship, they offer a considerable range of selection of practical courses in both the Lower and Upper Divisions.

1) Complete 96 credits, including the required work in Physical Education, Military Science, or Aerospace Studies.

2) Complete a major of 30 credits in one or more closely related departments of the college in which the Certificate is granted.

3) Complete a minor of 15 credits closely related or basic to the major subject. This need not be in the same college.

4) Complete 29 credits in the basic groups, as follows: Language, five; Basic Communications, 1, 2, 3, nine; Exact Science, five; Biological Science, five; and Social Science, five.

5) Complete 21 credits of elective work.

For additional information, see description of work in the college concerned.

In the College of Engineering definite programs of study are prescribed leading to Certificates of Completion within definite fields of applied industrial work. These curricula may be found in the catalog section on College of Engineering.

## Bachelor 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 Agriculture, Engineering and Natural Resources are awarded the Bachelor of Science Degree.

Graduates of the Colleges of Business and Social Sciences, 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 and Arts may be awarded the Bachelor of Science degree, the Bachelor of Arts degree, the Bachelor of Fine Arts degree, the Bachelor of Landscape Architecture, 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 General Education groups, in English Composition, and in Physical Education or in Military Science, or Aerospace Studies. All students who receive the Bachelor of Arts degree must have completed two years' training or equivalent in a foreign language.

If a student is planning to graduate at the next Commencement, he should consult his major professor and jointly prepare the "Admission to Candidacy" form not later than the fourth week of the Fall Quarter. He is admitted to candidacy when the plan of course work presented is found to fulfill all remaining requirements for graduation.

### Summary of

#### Graduation Requirements

For students who will graduate at the next commencement, the following additional requirements must be met. Responsibility for

satisfying the requirements for graduation rests upon the student.

1) All graduates of the state universities of Utah 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 20, History of American Civilization (5 credits); Political Science 10, American National Government (5 credits); Economics 51, General Economics (5 credits); e) Courses completed in other schools equivalent to any one of the above.

2) Women must complete three quarters of Physical Education.

3) Men must complete three quarters of either Physical Education, Military Science or Air Force ROTC. If exempt from Air Force ROTC, Military Science and Physical Education, they must present one credit of other work for each quarter they have been exempt.

ROTC is a four-year program consisting of two two-year courses: Basic and Advanced. Entrance into the Basic Course is elective, admission to the Advanced Course is both elective and selective. Upon entering either course, completion thereof becomes a prerequisite for graduation, unless one is discharged in accordance with the provisions of Army Regulation 145-350 or Air Force Regulation 45-48 and AFROTC Manual 45-1.

4) One hundred eighty-six credits of acceptable collegiate

work, including the required credits in Physical Education, Military Science or Aerospace Studies, of which a minimum of 150 credits must be "C" grade or better.

5) Sixty credits of Upper Division work.

6) The completion of a major, a minor, and related work as outlined under *Upper Division*.

7) The completion of the group requirements and of nine credits in Basic Communications or its equivalent.

8) The maximum amount of home study credit which can be applied toward a Bachelor's degree is 45 credits.

9) Applicants for degrees who have taken courses for credit through extension classwork or home study courses are subject to the regular University admission requirements and must file transcripts of credit with the Office of Admissions and Records.

10) Candidates for a Bachelor's degree must complete at least 45 credits in residence at Utah State University, 15 of which must be included within the last 60 credits presented for the degree.

With the approval of the dean of the college from which the student graduates, 15 credits in courses, approved for this purpose, taken in designated centers may be counted toward the residence requirements for the Bachelor's degree.

For the Master's degree at least 27 credits taken in residence are required; thesis credit counts toward the residence requirement. For the Master's degree not requiring a thesis, nine credits in course work approved for this purpose taken in designated centers may be counted toward the residence requirement.

11) No more than 108 hours of transfer credit from junior colleges will be accepted toward graduation.

12) Four passing grades, "A," "B," "C," and "D" are employed in reporting credit. No credit with a grade lower than "D" can count toward satisfying credit requirements.

Grade points have been assigned to grades as follows: 4 grade points for each credit of "A," 3 for each credit of "B," 2 for each credit of "C," 1 for each credit of "D," and 0 for each credit of "F." For graduation, one must have twice as many grade points as he has credits for which grades of "A," "B," "C," "D," and "F" have been assigned. Credits of "P" grade are disregarded in computing grade point averages.

13) The candidate should file an application for graduation with his academic dean at the beginning of his Senior year. This application must show the course of study to be followed in order to complete all requirements for graduation and must be approved by: a) the professor in charge of the major subject; b) the dean of the college in which the major work is done.

14) He should obtain a diploma fee card at the Office of Admissions and Records and pay the \$5.00 fee at the Cashier's Office prior to January 15 of the year in which he expects to graduate. A late fee will be charged if the diploma fee is paid after January 15.

15) The candidate must have discharged all University fees.

16) Attendance at Commencement Exercises is expected of all candidates. If unable to attend, one must notify the dean of his college and be officially excused in advance.

**17) 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 that were required for his first standard four-

year degree. A student cannot work on two undergraduate degrees concurrently. The candidate for a second Bachelor's degree must file an application with the Office of Admissions and Records and must secure the recommendation of his academic dean. He

must also meet the requirements of the major department.

**Note:** The first Bachelor's degree must represent a standard four-year program and must have been awarded by an accredited college or university.

## Honors Courses

The University sponsors Honors Courses supervised by a University-wide committee representing the academic deans. Enrollment is limited. Students may be admitted on the recommendation of their department head, or upon direct application to one of the instructors. The courses will ordinarily be taught by two or more instructors from different academic fields. The aim is to give superior Upper Division students from several departments opportunity to read, discuss, and write about significant facts and ideas, approached from a broader point of view than is ordinarily

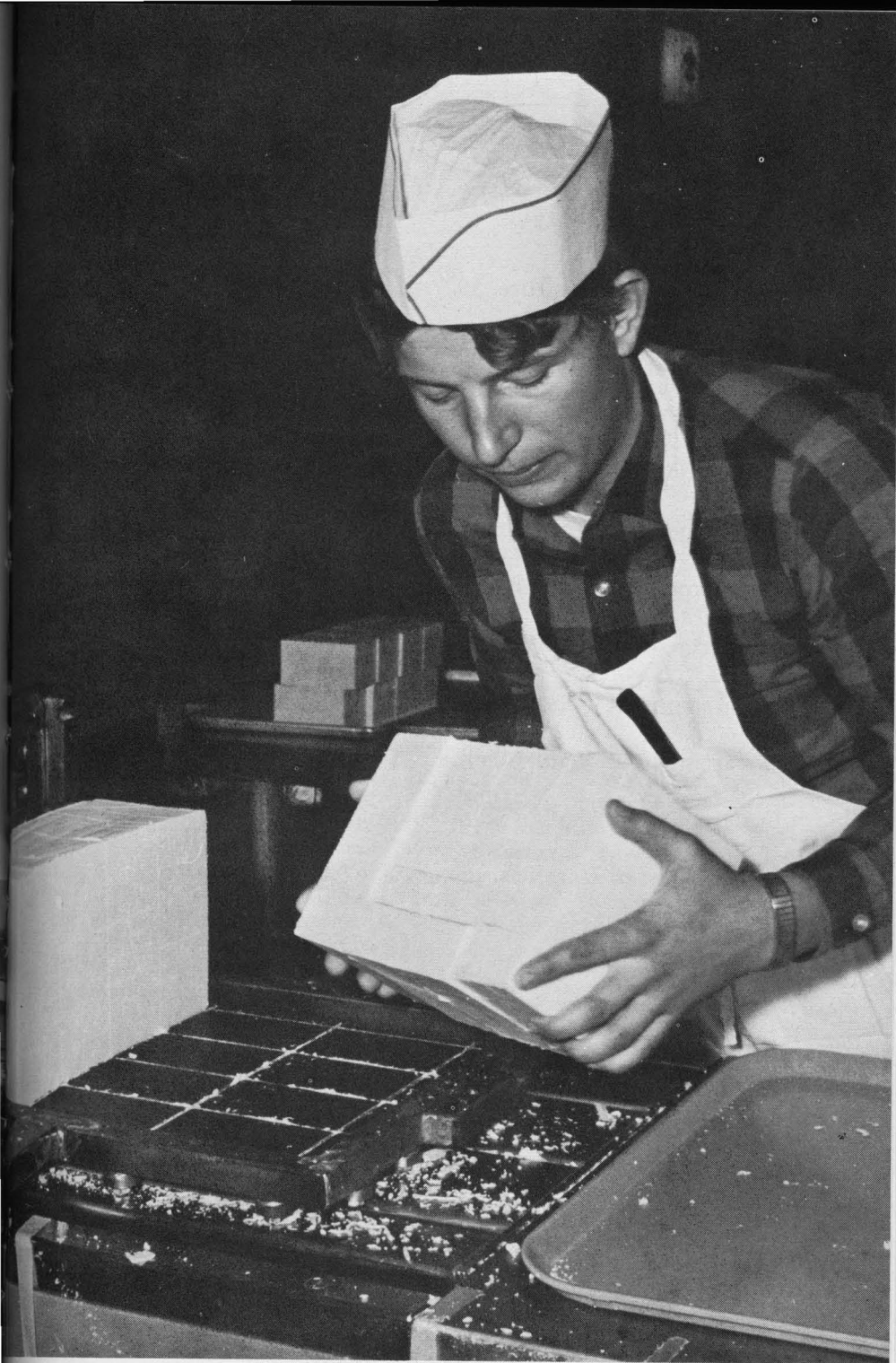
possible in advanced departmental work.

- |  |       |
|--|-------|
| 111. Perspectives of Contemporary Thought. | Staff |
| Senior Colloquium 1. (2F)                  |       |
| 112. Roots of Modern Educational Thought.  | Staff |
| Senior Colloquium 2. (2W)                  |       |
| 113. Far Eastern Thought.                  | Staff |
| Senior Colloquium 3. (2Sp)                 |       |
| 114. The Utopian Ideal in Literature.      | Staff |
| Senior Colloquium 4. (2W)                  |       |

Under general policies established by the University Honors Committee, the College of Engineering offers honors courses for selected Upper Division students in Engineering.







*COLLEGE OF AGRICULTURE*

College of

## Agriculture

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## College of

# Agriculture

**Yearl R. Smith, Dean**

**Doyle J. Matthews, Assistant to the Dean**

Office in Agricultural Science 223A

Agriculture today is a dynamic, rapidly changing industry. There are few fields of work that can offer such interesting and challenging opportunities. Agriculture includes much more than farming or producing food and fiber. It includes all the occupations connected with the production, processing and distribution of farm products.

Agriculture is the nation's largest industry. Of the 65 million people employed in the United States, about 26 million (40 percent) work in agriculture, nearly eight million of these (12 percent) work on farms, seven million produce for and service farmers, and 11 million process and distribute farm products. In addition, about a half million scientists serve agriculture directly or indirectly. The agricultural industry is the biggest buyer, seller and borrower in the U.S.—and it has the biggest investment. It uses more steel, rubber, petroleum, trucks, tractors and more electricity than any other industry.

Today's agriculture offers students unlimited opportunities. But it is highly competitive, and to be fully successful one must be well trained.

Utah State University, Utah's land-grant institution, is equipped to help one qualify for special positions as well as to gain a broad general education in the basic sciences and in the humanities. Its staff and facilities provide an opportunity for preparation for an interesting and profitable career.

Staff members of the Agricultural Experiment Station are devising better methods of feeding

and cropping and are developing more valuable strains of fruits, crops, and livestock, and more remunerative systems of marketing agricultural products. These activities are studied by the student first hand, and student employment enables many to take active part in the research work of the Experiment Station. This arrangement gives a clear insight into scientific methods and valuable practical experience. Attention is given to improved methods in farming operations, in use of tools and machinery, and in management of livestock and crops.

The great practical value of the various curricula of the College of Agriculture is shown by the records of graduates who have gone back to the farm, or have become specialists and teachers or investigators, and have become leaders in their chosen work.

## Facilities and Equipment

**The Agricultural Science Building** houses the administrative offices of the College of Agriculture, the Agricultural Experiment Station, and the Extension Services. The Departments of Agricultural Economics, Plant Science, Agricultural Education and Soils and Meteorology are also housed in this building.

The Animal Science, Dairy Science and Food Science and Industries Departments are housed in the Animal Science Building. Veterinary Science occupies a separate building.

The various departments in the

College of Agriculture are well equipped and have up-to-date facilities for teaching and conducting research in modern scientific agriculture. **Animal Science** provides modern chemical laboratories, an animal metabolism building, a new meats and physiology laboratory, and a new livestock pavilion. Outstanding groups of beef cattle, sheep, swine, poultry, and horses offer real advantages to students in relating natural sciences to efficient production of livestock and poultry. **Dairy Science** operates a dairy farm for student instruction, experience and research. Students gain experience in these facilities and most are employed for a portion of the time in these or in the research and teaching laboratories associated with them. **Food Science and Industries** operates a food processing and pilot food processing plant. Many fine pieces of equipment are available in these plants for instructional and research purposes. The principles of processing food products and the development of new and better processing methods are sought continuously. **Plant Science** is noted for its modern, well-equipped laboratories, growth chambers, greenhouses, and complemented by eight experimental farms located throughout the state to give students unique opportunities to learn. This department provides students with opportunities to apply knowledge of physical and biological science to the growth and production of plants and food processing. **Soils and Meteorology** is recognized for the excellence of its laboratories for studying soil and water conservation and utilization. The influence of soil and atmospheric

environment on plants and animal growth and behavior is intensively studied. Controlled environmental chambers, flame photometers, atomic adsorption spectrophotometer, gas chromatograph, Geiger counters, meteorological equipment, potentiometer, bridges, controller, and recorders are examples of modern equipment which students learn to build, maintain, and use. **Veterinary Science** has equipment and facilities which are available for teaching and research in histopathology, in physiologic pathology, in the use of embryonating eggs for bacterial and viral culture and toxicology, and in tissue culture techniques. These endeavors are supported by necropsy, diagnostic, and experimental animal laboratories. **Agricultural Economics** is outstanding in its training of students desiring economic or business orientation in agriculture. Students are provided with calculators, and electronic computers are made available through arrangement with the University Computer center. Through such facilities students may become acquainted with the modern methods of data analysis such as linear programming, which can be used in various ways in studying the effects of a variety of factors on the economic outcome of problems. **Agricultural Education** involves students in modern agricultural science and also cooperates with teachers of Vocational Agriculture in 43 high schools in the preparation of teachers and in furnishing classrooms, shops and laboratories. A non-degree program in the department trains students for occupations in agricultural machinery and equipment fields.



# Curricula in Agriculture

Students may work toward the Bachelor of Science degree in the departments of Agricultural Economics, Agricultural Education, Animal Science, Dairy Science, Plant Science, and Soils and Meteorology. Pre-veterinary training is given in the Veterinary Science department.

Three basic curricula that may be offered by departments are: 1) Science, 2) General or Production, 3) Business. Departmental listings detail the requirements for these curricula.

## Science

Students who choose the Science curriculum are taught the fundamentals of physical and biological sciences that are significant to agriculture. They gain a solid base of science courses that prepares them for graduate work and eventually research and teaching careers in the natural sciences. Graduates in this curriculum are also prepared to do research or technical work in agriculturally oriented fields such as the chemical industry, as related to fertilizers and pesticides, livestock health, feed industry, crop breeding, water use, and technical aspects of food processing. Science curricula must meet the following minimum requirements:

Course	Credits
Physical Science .....	45
Biological Sciences .....	15
Humanities .....	10-15
Social and Behavioral Sciences .....	10-15
English 1, 2, 3 .....	9
MS, AS, or PE .....	3

A science curriculum is offered in the departments of Animal Science, Dairy Science, Plant Science, Soils and Meteorology, and Veterinary Science.

## General or Production

This curriculum is designed to

educate young people to meet the special demands of today's farming. Successful modern agricultural production requires an understanding of the latest relevant scientific knowledge and an ability to apply the information in the field. A student who plans to farm, to be a farm manager, to work directly with farm operators as a businessman, or as a government or farm organization employee, will probably satisfy his needs by taking the Production curriculum. General curricula must meet the following minimum requirements:

Course	Credits
Physical Sciences .....	23
Biological Sciences .....	15
Humanities .....	10-15
English 1, 2, 3 .....	9
Irrigation and Drainage .....	3
MS, AS, or PE .....	3
Social and Behavioral Sciences .....	10-15
Agricultural Economics or Equivalent ....	9
1 An Sci, 1 Pl Sci, and 1 Soils class .....	9

This curriculum is offered in the departments of Agricultural Economics, Agricultural Education, Animal Science, Dairy Science, Plant Science, and Soils and Meteorology.

## Business

The businesses and industries that buy from and sell to farm people are expanding and need men and women trained in agriculture. These enterprises include feed, fertilizer, machinery, and chemical firms that supply the farmer's needs and marketing firms that assemble, process, ship, and merchandise his products. Managers of large scale farm enterprises also profit from the kind of education provided by the Business curriculum. Students who want to capitalize on their agricultural background while pursuing a business or industrial career, should choose the Business option. Business curricula

## 40 College of Agriculture

must meet the following minimum requirements:

Course	Credits
Physical Sciences .....	23
Biology .....	10
Social and Behavioral Sciences including	
Business .....	27
Humanities .....	10
MS, AS, or PE .....	3
English 1, 2, 3 .....	9

This curriculum is offered in the departments of Agricultural Economics, Animal Science, Dairy Science, Plant Science and Soils and Meteorology.

Interdepartmental and intercollege cooperation has and will continue to facilitate the development of various other curricula. Students should not hesitate to inquire about the possibilities of following a curriculum that would allow for certain special needs.

### Two-Year Program in Agriculture

A two-year course in practical agriculture may be taken if students do not wish to take more than two years of college work. They may register for any of the regular non-prerequisite production, marketing, and management courses in the College of Agriculture. Practical farm problems are emphasized.

### A Minor in Journalism

A minor in Journalism for Agriculture majors has been approved. It consists of 18 credits in Journalism courses as follows: Journalism 12, Introduction to Journalism; Journalism 13, Reporting; plus 10 credits selected from Journalism 112, Feature Writing; Journalism 164, Publicity Methods; Journalism 184, Television and Radio Writing; Journalism 14, Editing; and Journalism 166, Journalism Practices.

### Interdepartmental Major in International Agriculture

Students interested in foreign

assignments may wish to major in International Agriculture. Expanding University programs in foreign lands, as well as recent federal legislation supporting agricultural development in underdeveloped countries indicates that those trained for this type of work will be in high demand for many years to come.

Students majoring in International Agriculture may choose from three specializations: animal sciences, agronomy, and agricultural economics. The curriculum which pertains to training in each of the options in international agriculture are as follows:

Core Curriculum	
Course	Credits
English 1, 2, 3 .....	9
Physical Education .....	3
Exact Sciences .....	23
Biological Sciences .....	10
Humanities .....	15
Must Include: Language <sup>1</sup> .....	10
Social and Behavioral Sciences .....	21
Must Include: Geography 5, 6, or 7 ..	3
Political Science 10 or 70 .....	3-5
Sociology 70 or 155 .....	3-5
Anthropology 90 or 92 .....	3-5
Ag. Economics 71, 72, and 73 or equivalent .....	9
Agriculture and Agriculture Related .....	33
Must Include: Animal Science 10 or equivalent .....	5
Plant Science 2 or equivalent .....	4
Soils 56 .....	4
Agricultural Education 151 and 101 or 103 .....	8
Veterinary Science 20 or 120 .....	4-5
World Food: Supply and Demand ..	3
Agricultural Entomology 108 .....	5

Specializations	
Course	Credits
<b>Animal Sciences</b>	
Animal Science 2, 3, 41, 42, 50, 110, 120, 125, 142, 150, 151, 152, 155 and 185 .....	35
Food Science and Industries 60 .....	5
Dairy Science 110 .....	5
Additional Biology .....	10
Veterinary Science 150 .....	3
Ag. Engineering 10 or 110 .....	3-4
Plant Science 103 .....	3

<sup>1</sup>English for non-English speaking students.

Course	Credits
<b>Agronomy</b>	
Meteorology 17 .....	3
Soils 107, 155, and 156 .....	7
Soils 114 or 165 and 166 .....	4-5
Plant Science 4, 60, 100, 101, 103, 115, 119, 131 .....	27

Course	Credits
<b>Agricultural Economics</b>	
Economics 107, 108, 165, and 180 .....	16

Business Administration 4, 133, 149, 151, 171, or 181 .....	10
History 4 and 5 .....	10
Humanities (electives) .....	10
Agricultural Economics 102, 130, 106, 112, 145, 163, and 180 .....	21
Electives .....	12

**Graduate Work.** Graduate work is available in all departments of the College of Agriculture.

## Department of

# Agricultural Economics

**Head: Professor N. Keith Roberts**  
Office in Agricultural Science 230

**Professors** Roice H. Anderson, Lynn H. Davis, B. Delworth Gardner, Leon C. Michaelson, Earnest M. Morrison, Morris H. Taylor, E. Boyd Wennergren;<sup>1</sup> **Professor Emeritus** George T. Blanch; **Associate Professors** Rondo A. Christensen, Lloyd A. Clement, Ellis W. Lamborn, Allen LeBaron; **Assistant Professor** Darwin B. Nielson; **Research Assistant** Stuart Richards; **Collaborators** Jay C. Anderson, Clyde E. Stewart.

**Degrees:** Bachelor of Science (BS), Master of Science (MS), Doctor of Philosophy (PhD).

**Major:** Agricultural Economics.

Agricultural Economics includes the study of economic principles related to the production and distribution of agricultural products, to the management and allocation of public and private resources, and to the impact of agricultural and resource policies on farms and farm businesses and on local, national, and international economies. With this training a wide range of employment opportunities will be open. This will include the successful operation of a farm, teacher, research and extension worker, foreign service specialist, operator or employee in any of many agricultural processing or service businesses, or policy adviser at local, state, national, or international levels.

degree may be satisfied under either the Agricultural Business or the General Agricultural options. Also, Agricultural Economics is an option in the International Agriculture curriculum. The choice of the curriculum to follow need not be made before the beginning of the Junior year since the courses recommended for the Freshman and Sophomore years are the same for the major options.

## Lower Division

The courses suggested for the first two years are intended to satisfy two basic objectives: 1) to fill the University group requirements, and 2) to lay a broad and solid foundation for the more specialized and advanced courses that will be taken during the last

## Undergraduate Study

The requirements for the B.S.

<sup>1</sup>On assignment in Bolivia

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two years. Agricultural Economics 71, 72 and 73 or their equivalents, are prerequisites to all other courses in Agricultural Economics except Agricultural Economics 56.

### Suggested for the Freshman Year

Course	Credits
English 1, 2, 3 .....	9
Math 34, 35 .....	8
Agricultural Economics 71, 72, 73 or equivalent .....	9
Biology 15 .....	5
Social Sciences .....	10
Botany 26 .....	5
MS, AS or PE .....	3
<b>Total</b> .....	<b>49</b>

### Suggested for the Sophomore Year

Course	Credits
Chemistry 20, 21, 22 or 10, 11, 12 .....	15
Humanities .....	10
Economics 51, 52 .....	10
Agricultural Economics 56 .....	3
Animal Science 10 .....	5
Zoology 16 or Bacteriology 70 .....	5
<b>Total</b> .....	<b>48</b>

## Upper Division

The student and his adviser will select from the following areas the specific courses that will best satisfy the particular goals of the student.

### General Agricultural Option:

#### Suggested for the Junior Year

Course	Credits
Agricultural Economics 130, 121, 122, 155, 163, 130 .....	17
Animal Science 110 or Dairy Science 110 ..	13
Plant Science 7, 8, 103 .....	10
Soils 56 .....	4
Agricultural and Irrigation Engineering 10 or 110 .....	3
Electives .....	3
<b>Total</b> .....	<b>50</b>

#### Suggested for the Senior Year

Course	Credits
Agricultural Economics 102, 106, 112, 170, 180, 145, 186 .....	17
Economics 107, 108, 165, 180 .....	16
Electives .....	15
<b>Total</b> .....	<b>48</b>

### Agricultural Business Option:

#### Suggested for the Junior Year

Course	Credits
Agricultural Economics 121, 122, 130, 155, 163 .....	17

Soils 56 .....	4
Animal Science 110 .....	5
Accounting 1, 2, 3 .....	9
Business Administration 20, 133, 143 .....	12
Electives .....	3
<b>Total</b> .....	<b>50</b>

### Suggested for the Senior Year

Course	Credits
Agricultural Economics 102, 112, 145, 170, 180, 186 .....	17
Economics 107, 108, 165, 180 .....	16
Business Administration 151, 171 .....	10
Electives .....	5
<b>Total</b> .....	<b>48</b>

## Graduate Study

**Master of Science Degree.** The department offers the Master of Science degree with emphasis in any one of several divisions such as: Agricultural Business Management, Farm or Ranch Management, Resource Economics, Agricultural Finance, and Agricultural Marketing. Research in these areas is conducted by department staff and Federal Collaborators, with the assistance of graduate students. The MS degree is accepted by other universities as one year's work done toward the PhD degree.

### Doctor of Philosophy Degree.

The department, in cooperation with the Department of Economics, and the support of the Department of Applied Statistics and other related departments, offers the Doctor of Philosophy degree. The degree program includes emphasis in the areas of Resource Economics, Farm Management or Agricultural Marketing.

## Agricultural Economics Courses

56. **Agricultural Business Records.** Methods of keeping and analyzing physical input-output and financial records for Agricultural business firms. (3F) **Christensen**

71, 72, 73. **Fundamentals of Agricultural Economics.** A basic introduction to the field and principles of Agricultural Economics. (3F, 3W, 3Sp) **Staff**

102. **Intermediate Farm Management.** Principles and practices associated with the successful operation of farms. (3F) **Morrison**



**106. Land Economics.** Economic principles underlying utilization, valuation and tenure of land and water. Attention given prevailing policies, methods and techniques involved in dealing with economic problems of land and water use. (3F) **Stewart**

**112. Agricultural Cooperatives.** Principles of cooperation; organization, operation and management of cooperative sales, purchasing, and service associations. (3Sp) **Anderson**

**116. Livestock Economics.** Application of farm management and agricultural marketing principles to the economic production of livestock and livestock products. (3F) **Lamborn**

**\*121, 122. Agricultural Statistics and Research Techniques.** An introduction to the research process in solving problems in Agricultural Economics. Emphasis will be placed on basic techniques used in collecting, analyzing and presenting research data. (4W, 4Sp) **Davis**

**130. Agricultural Credit.** Principles of credit applied to financing agriculture and analyzing of credit institutions and agencies financing agriculture. (3W) **Morrison**

**131. Agricultural Credit Procedures.** Emphasis will be given to procedures in accepting and analyzing credit applications, writing credit instruments, and supplemental papers, and servicing loan arrangements and security. Consideration will be given to production, intermediate and farm mortgage financing. Prerequisite: Ag Econ 104. (3Sp) **Morrison**

**145. Agricultural Businesses.** Application of economic and management principles to farm related firms that market and process farm products and provide farms with supplies and services. (3Sp) **Christensen**

**150. Special Readings.** Directed readings on selected problems for undergraduates. Credit arranged. (F, W, Sp, Su) **Staff**

**155. Law on the Farm.** A non-technical consideration of some legal rights, responsibilities and liabilities associated with the operation of a farming business. (3W) **Morrison**

**163. Intermediate - Agricultural Marketing.** Principles and functions of marketing and their application to the marketing of agricultural products. (3W) **Anderson**

**164. Commodity Marketing Analysis.** Deals with marketing problems specific to particular agricultural products. An analytical approach will be used, including measurement of demand for the product, appraising the accuracy of the pricing system which reflects this demand to producers, and possibilities of reducing marketing costs. (2Sp) **Anderson**

**170. Farm and Ranch Appraisal.** An integrated presentation of the factors, principles and techniques used in determining the money

value of farm and ranch properties. Two lectures, one laboratory each week. (3Sp) **Davis**

**172. Advanced Farm and Ranch Management.** Problem solution and practices associated with the successful organization and operation of farms utilizing economic and farm management principles through projecting linear programming and other methods of analysis. Prerequisite: Ag Econ 102. (3W) **Davis**

**180. Government and Agriculture.** A study of government in relation to selected economic problems, past and present, in agriculture. Emphasis is on the problems, the objectives of government action, the alternative proposals for action, action taken, and the results, so far as they can be interpreted. (3Sp) **Blanch**

**186. Land and Water Problems.** The application of economic principles and techniques to the development, use and conservation of land and water resources. (3W) **Andersen**

**200. Agricultural Production Economics I.** Economic principles and their application to specific production functions in agriculture. (5W) **Davis**

**214. Thesis.** Credit arranged. (F, W, Sp, Su) **Staff**

**220. Agricultural Production Economics II.** Theory of economic decision making as applied to production problems. Static and stochastic models. Effects of different decision criteria on optimization procedures. (3Sp) **Nielsen**

**235, 236, 237. Seminar.** Required of all senior and graduate majors. (1F, 1W, 1Sp) **Staff**

**240. Research Methodology.** Philosophy of research and importance of application of scientific method to solution of research problems. (2F) **LeBaron**

**241. Research Methodology.** Introduction to the similarities between statistical methods and the system by which scientists establish hypothesis and test hypothesis by means of experimental data. The relation of statistical theory to the design of experiments will be emphasized. Prerequisites: Applied Statistics 171, 172, 173. (2Sp) **Nielsen**

**250. Special Problems.** Directed study on selected problems for graduates. Credit arranged. (F, W, Sp, Su) **Staff**

**257. Resource Economics.** Application of welfare and allocation theory to resource development. Evaluation of public investment decisions. Economic and philosophical implications implicit in the development of federal and state resource policy. (3Sp) **Gardner**

**263. Advanced Marketing.** Economic principles applied to the solution of agricultural marketing problems. (5F) **Lamborn**

\*Taught 1968-69

265. **Agricultural Price Analysis.** Application of statistical techniques to derivation of agricultural supply and demand functions. Time series and cross sectional analysis, single and simultaneous equation estimation. (3W) **Staff**

280. **Agricultural Policies.** Application of economic principles and methods of analysis to the formulation and appraisal of agricultural policies and programs. (5Sp) **Morrison**

## Department of

# Agricultural Education

**Head:** Associate Professor Von H. Jarrett  
Office in Agricultural Science 110

**Professor Emeritus** Stanley S. Richardson; **Instructor** Keith W. Hatch.

**Degrees:** Bachelor of Science (BS), Master of Science (MS).

**Major:** Agricultural Education.

The program offered in Agricultural Education is for students who are preparing for positions in vocational agriculture, agricultural missions, or other agricultural careers. It is also designed to prepare individuals for agricultural education work in agricultural industries, commercial agriculture, and public relations.

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.

Preparation in Agricultural Education includes technical agriculture as well as principles and techniques of teaching. Advanced students will be placed with teachers for practical experiences.

Students interested in teaching ornamental horticulture, agricultural business, agricultural mechanics or other phases of agriculture will be guided into areas of their major interest. Agricultural backgrounds or agricultural experiences are desirable, but not mandatory.

## Undergraduate Study

Students interested in a two-year agricultural power and mechanics technician program or other two-year technician programs should consult with staff members of the Department of Agricultural Education. These programs are being developed to meet the needs of persons interested in employment opportunities with agricultural equipment companies, dealers, or others and are for the purpose of developing skilled mechanics or other technicians who get both a practical and technical background.

### FRESHMAN YEAR

Course	Credits
English 1, 2, 3 .....	9
Math 30 or 34, 35 or 46 .....	8-10
Biological Science — Biology 15, Bacteriology 70, Botany 26 .....	15
Animal, Dairy, or Veterinary Science .....	6-8
Plant Science .....	4-5
MS, AS or PE .....	3

### SOPHOMORE YEAR

Course	Credits
Chemistry 20, 21, 22 or 10, 11, 12 .....	15
Agricultural Economics 71, 72, 73 (may be taken first year in lieu of Animal or Plant Science) .....	9
Animal, Dairy, or Veterinary Science .....	3
Plant or Soil Science .....	3-4
Humanities — Psy 53, LA 3 .....	8
Agricultural Education 1 .....	5

Social Science — Hist 20, Pol Sci 10 .....	10
MS, AS or PE .....	3

### JUNIOR YEAR

Course	Credits
Agricultural Education 101, 102, 103 .....	15
Biological Science — Zoology 112 .....	5
Psychology 100 and 106 .....	6
Education 126, 150 .....	6
Animal, Dairy, or Veterinary Science .....	6-8
Plant or Soils Science .....	6-8
Agricultural Economics .....	3

### SENIOR YEAR

Course	Credits
Humanities (Literature, Speech, Music or Art, Soils and Met 117, Plant Science 118) .....	3-5
Social Science — Econ 51 .....	5
Agricultural Education 124, 125, 126 .....	17
Public Health 155 .....	3
Plant or Soils Science .....	3-7
Animal or Dairy Science .....	1-5
Extension Methods .....	3
Agricultural or Educational electives .....	3

Total hrs. — 196 as follows: Institutional and general 77; Agriculture 84; Education 32; MS, AS, or PE 3.

## Graduate Study

Opportunity is offered for research and graduate study in Agricultural Education. See the Graduate Catalog.

### Agricultural Education Courses

**1. Agricultural Mechanics.** Selection, care, and use of power tools and equipment. Sheet metal, hot and cold metal, agricultural drafting, and shop safety. Three lectures, two labs. (5F, W) Staff

**13. Specialized Forage Equipment.** The application of fundamental principles in purchasing, repairing, and maintaining forage equipment, namely: windrowers, mowers, rakes, balers and pelleting machines. Staff

**101. Agricultural Construction.** Especially for agricultural students. Planning, estimating, layout construction materials, painting, wiring, plumbing, concrete and masonry as related to farm structures. Three lectures, two labs. (5Sp) Jarrett

**102. Farm Power.** Operation, care, and maintenance of tractors and farm engines. Diesel, L.P.G., 4-cycle and 2-cycle engines and electric motors. Three lectures, two labs. (5W, Sp) Jarrett

**103. Agricultural Machinery.** Selection, operation, maintenance, repair and management of

farm machinery, including materials or construction, mechanics, transmission of power, adjustment of tillage, planting, spraying, dusting, forage, and harvesting equipment, brazing cast iron, hard facing, and use of the carbon arc torch. Three lectures, two labs. (5F) Jarrett

**104. Senior Project.** Involves scaled drawing, cost estimating, construction and formal report on student-selected project. (3Sp) Jarrett

**112. Principles of Vocational Education.** Fundamentals in general and vocational education. Social and economic basis for vocational education. (2W) Richardson

**124. Methods of Teaching Agricultural Mechanics.** Scope of mechanics in agriculture, lesson planning, course of study preparation, shop equipment and management, skill requirements, and supervised practice. (3F) Richardson

**125. Methods of Teaching Agriculture.** Fundamental principles and practices of teaching. Special attention is given to selection, organization, and teaching agriculture and supervision of agricultural activities on the farm. (5W, Sp) Richardson

**126. Directed Teaching in Agriculture.** Students observe and teach under supervision in approved vocational agriculture departments. Students will leave the campus to teach for five or six weeks. (4-9W, Sp) Richardson

**151. Extension Methods.** For prospective home demonstration and county agricultural agents. History, objectives, organization and accomplishments of extension work in the United States. Farm and home problems, youth and adult education, and extension methods. (3Sp) Staff

**225. Special Problems in Agricultural Education.** A consideration of needs and special types of service in FFA, Young Farmer and Adult programs. For upper division and graduate students. (2-5F, Sp) Richardson

**280. Research and Thesis.** Credit Arranged. (F, W, Sp, Su) Staff

**281. Seminar.** Studies and reports on research and new developments. One quarter required for all majors in Ag Ed. (1F, W, Sp) Staff

**290. Special Problems.** For teachers of vocational agriculture who desire to develop a more practical program for future, young, and adult farmers. (3Su) Staff

**291. Special Problems for Agriculture Teachers.** For teachers who participate in the Annual Summer Conference for Teachers of Vocational Agriculture. (2-5Su) Staff

Department of**Animal Science**

**Head:** Professor James A. Bennett  
Office in Animal Science 201

**Professors** Jay O. Anderson, John E. Butcher, Carroll I. Draper, Lorin E. Harris, Doyle J. Matthews, Joseph C. Street; **Associate Professors** C. Elmer Clark, Warren C. Foote, Russell R. Keetch, Milton A. Madsen, Darrell H. Matthews,<sup>1</sup> Hyrum Steffen; **Assistant Professor** Donald C. Dobson; **Research Associates** Sherwin Atkinson, David O. Williamson; **Research Assistant** Robert E. Warnick; **Research Associate** J. M. Asplund.

**Degrees:** Two-year Program Certificate of Completion, Bachelor of Science (BS), Master of Science (MS), Doctor of Philosophy (PhD).

**Majors:** Animal Science, Animal Breeding, Nutrition, Physiology, and Management.

A student majoring in Animal Science may obtain a Bachelor of Science degree under one of three curricula, viz. science, production or business.

The **Science curriculum** will prepare you for graduate work or technical employment in research, teaching or extension work in a university, in industry or in government, or for the positions listed under the production curriculum. If you have high scholastic standing and marked ability in the fundamental sciences, you will find excellent opportunities in this area.

The **Production curriculum** will prepare you to be a farm or ranch operator or manager in livestock or poultry, a county agent, or to take a position related to livestock or poultry raising with various other commercial state and federal agencies.

The **Business curriculum** will train you in the business phases of livestock and poultry production and also prepare you for employment with commercial companies associated with these enterprises.

**Undergraduate Study**

**Two-year Program in Animal Science.** A two-year course in

Animal Science leading to a Certificate of Completion is offered. This course is available to train students for efficient livestock production who do not wish to complete the four-year course leading to the Bachelor of Science degree.

Additional information concerning required courses can be obtained from the department.

**Lower Division**

Suggested course of study for the first two years for ALL Curricula is as follows:

FRESHMAN YEAR	
Course	Credits
Animal Science 2 or 3, 50 .....	3-4
English 1, 2, 3 .....	9
Math 34, 35, 44 <sup>2</sup> , or 46 <sup>2</sup> .....	11-13
Agricultural Economics 71, 72, 73, or equivalent .....	9
Social Sciences or Humanities .....	10
Biological Science .....	5
MS, AS or PE .....	3
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SOPHOMORE YEAR	
Course	Credits
Animal Science 41, 42 .....	2
Chemistry 20 <sup>2</sup> , 21 <sup>2</sup> , 22 <sup>2</sup> or 10, 11, 12 .....	15
Veterinary Science 20 .....	5

<sup>1</sup>On assignment in Bolivia

<sup>2</sup>These courses are required in the science curriculum. They are recommended but not required in the other curricula.



Social Sciences or Humanities .....	15
Biological Science .....	10
MS, AS or electives .....	3
	<hr/> 50

Suggested course of study for the Junior and Senior years in the Science Curriculum:

JUNIOR YEAR	
Course	Credits
Animal Science 142, 150, 151, 152, 155 or Animal Science 142, 150, 151, 107, 155..	15
Soils 56 .....	4
Chemistry 121, 122 .....	8
Zoology 112 .....	5
Exact Science to be selected from Math 96, 97, 98, 99; Physics 17, 18, 19 or 20, 21, 22 .....	20
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SENIOR YEAR	
Course	Credits
Animal Science 142, 150, 151, 152, 155, 165 or Animal Science 104, 123, 126, 185....	11
Chemistry 115, 180 .....	9
Physiology 121, 122 .....	10
Veterinary Science 120 .....	4
Plant Science 103 or Range Management 160, 161 .....	4-6
Electives .....	6
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Suggested course of study for the Junior and Senior years in the Production Curriculum:

JUNIOR YEAR	
Course	Credits
Animal Science 142, 150, 151, 152, 155, 165 or Animal Science 142, 150, 151, 107, 155, 105, 126 .....	18
Soils 56 .....	4
Zoology 112 .....	5
Plant Science 103 .....	4
Dairy Science .....	3
Library Science 50 .....	3
Irrigation and Drainage 10 or 110 .....	3
Electives .....	12
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SENIOR YEAR	
Course	Credits
Animal Science 110, 120, 125, 160, 175, 185 or Animal Science 104, 123, 126, 186....	11
Veterinary Science 120, 150 .....	7
Entomology 108 .....	5
Applied Statistics 51 .....	4
Range Management 160, 161 .....	6
Business 20 or 147, 63 .....	8
Agricultural Education 151 .....	3
Electives .....	10
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Suggested course of study for the Junior and Senior years in the Business Curriculum:

JUNIOR YEAR	
Course	Credits
An Sci 142, 150, 151, 152, 155, 165 or An Sci 142, 150, 151, 107, 155, 165 .....	18
Soils 56 .....	4
Zoology 112 .....	5
Plant Sci 103 or Range Mgt. 160, 161 .....	4-6
Ag Econ 105, 112, 163 .....	9
Accounting 1, 2, 3 .....	9
Electives .....	1-3
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SENIOR YEAR	
Course	Credits
An Sci 110, 120, 125, 160, 175, 185 or .....	18
An Sci 104, 123, 126, 185 .....	11
Ag Econ 145, 180 .....	6
Bus Adm 20, 63, 151 .....	10
Electives .....	16
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## Graduate Study

Course work and research leading to the Master of Science and the Doctor of Philosophy degrees are offered. Specialized fields of study for the Master of Science and Doctor of Philosophy degrees include: Animal Breeding, Nutrition, Physiology, and Management. Facilities are available to conduct research with farm animals, poultry, and laboratory animals. In cooperation with other departments the Master of Science and Doctor of Philosophy degrees are offered in Animal Nutrition and Biochemistry (see Interdepartmental Curriculum in Animal Nutrition and Biochemistry).

Detailed information on graduate programs in Animal Science may be obtained from the department or from the Dean of the School of Graduate Studies.

## Animal Science Courses

1. **Fundamentals of Animal Husbandry.** Live-stock production in relation to other phases of agriculture in the United States and Utah, influence of geographical location and conditions, various types of farm animals and functions performed or products produced, and introduction to important factors in successful livestock production. (3F) **Steffen**

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**2. Animal Husbandry Laboratory.** Exercises in judging, marketing, classification and practical problems. Should be taken at the same time as An Sci 1. Two labs. (2F) **Steffen**

**3. Poultry Production.** A study of breeds of chickens and turkeys, incubation, brooding, feeding, selection, marketing, and problems of production of chickens and turkeys. (3F)

**Staff**

**10. Feeds and Feeding.** Differences in digestive tracts of farm animals; physiology of digestion and feed utilization; composition of feeds; the balancing of rations; and feeding of farm animals. Four lectures, one lab. (5W)

**Steffen**

**30. Horse Husbandry.** Breeding, feeding, care and management of horses. (2Sp) **Bennett**

**41, 42. Livestock Practicum.** Development of skills in the feeding, care, fitting and showing of beef cattle, sheep and swine. Two labs. (1W, 1Sp)

**Madsen**

**50. Current Developments in Animal Husbandry.** Review and discussion of recent developments in the field of Animal Husbandry. Required of all students during the first quarter in attendance. (1F)

**Bennett**

**\*\*104. Poultry Physiology and Incubation.** A study emphasizing general morphology and function of physiological systems characteristic of the avian class with consideration given to principles of incubation and embryological development. Two lectures and one lab. (3Sp)

**Clark**

**\*\*105. Poultry Management.** Problems in locations of poultry farm, farm planning, renewing the flock and management problems of the growing, laying and breeding flocks. Prerequisite: An Sci 1. (2W)

**Draper**

**\*107. Applied Poultry Nutrition.** A study of the nutritive requirements of poultry, the composition of poultry feedstuffs, methods of feeding and formulation of rations for special needs. Prerequisites: An Sci 150, 151. (3Sp)

**Anderson**

**\*108. Poultry Products.** Problems in processing, grading, packaging, transporting, labeling, storing and marketing poultry products. (1F)

**Draper**

**110. Beef Production.** Factors involved in economical production of beef cattle, including organization of the enterprise, breeds of cattle, selection of breeding stock, production of maximum calf crop, handling and feeding animals of different ages on the range and in the feed lot, and marketing of surplus stock. Prerequisite: An Sci 152. (3F, Sp)

**Madsen**

**120. Swine Production.** Systems of production, with emphasis on those suited to western conditions. Breeding, management and feeding of the breeding herd, and of market swine. Prerequisite: An Sci 152. (3W)

**Steffen**

**123. Special Readings in Animal Science.** Selected readings to meet student needs. Available to upper division majors and by permission of department head and instructor. Credit arranged. (F, W, Sp, Su)

**Staff**

**125. Sheep Production.** Range and farm sheep, with emphasis on range production. Methods of production of lambs and wool, grading and marketing practices, feeding and studies of the breeds and their adaptation to the different husbandry practices. Prerequisite: An Sci 152. (3Sp)

**Madsen**

**126. Seminar.** Current literature studies, assigned problems and special topics. (1W)

**Staff**

**142. Physiology of Reproduction.** A study of the physiology of reproduction in mammals. Prerequisites: Zoology 16 or equivalent, Physiology 4, or Veterinary Science 20, and a course in organic chemistry; Physiology 141 recommended. Two lectures, one lab. (3W)

**Foote**

**150, 151. Principles of Nutrition.** Basic principles of the metabolism of nutrients and nutrient requirements of farm animals; nutritional diseases; and a consideration of investigational methods. Prerequisite: Chem 12 or concurrent registration. (3F, 3W)

**Street**

**152. Applied Animal Nutrition.** Compositions of feeds and adaptability to different species of farm animals; nutrient deficiencies and their correction through feeding, feeding systems for farm animals and feed formulation. Prerequisite: An Sci 151. (3Sp)

**Butcher**

**155. Animal Breeding.** Application of genetics to improvement of farm animals. Breeding systems, inheritance problems, fertility and sterility in larger farm animals. Prerequisites: Vet Sci 20, Zoology 112. Three lectures. (3Sp)

**Bennett**

**160. Livestock Production Problems.** Attention is given various problems in livestock production, especially in Utah. Prerequisites or concurrent registration: An Sci 152 and 155. (3Sp)

**Staff**

**165. Livestock Judging and Selection.** Animal form and its relation to function. Emphasis on evaluation of live animals in terms of their probable value of production of meat, wool or work. Emphasis on judging for both commercial and show ring purposes. The Livestock Judging Team is selected from students taking this course. Prerequisite: An Sci 2. Three labs. (3F)

**Madsen**

**175. Wool Technology.** Marketing and manufacturing of wool and laboratory techniques used in studying wool. Methods of grading, scouring and measuring length, diameter, crimp, density, tensile strength and other characteristics. Prerequisite: An Sci 125. (3W)

**Madsen**

\*Taught 1968-69

\*\*Taught 1969-70

**185. Meats.** Cutting, selection, and identification of wholesale and retail cuts of beef, pork, and lamb, with references to prices, relative economy, uses, nutritive value, chemical composition, and palatability. Preparation of meats for the home freezer is emphasized. (3W)

Matthews

**\*\*210. Techniques in Nutrition Research.** An original project is completed with the primary objective being to orient one on how to plan, conduct, and summarize research in animal nutrition. Prerequisite: An Sci 151. (2-6F, W, Sp)

Harris

**\*\*214. Advanced Animal Nutrition.** The measures for nutritional value of feed, nutrient requirements of animals, and the cause, detection, treatment and prevention of nutritional diseases. Prerequisite: An Sci 151. (3W)

Harris

**\*\*215. Nutritional Laboratory.** Review and practice in laboratory techniques used in nutrition research. Two labs. (2F)

Street

**220. Special Problems in Animal Science.** Selected readings discussions, lectures, literature reviews and research problems dealing with animal breeding, nutrition, physiology and management. Available to students of graduate standing and by permission of the instructor. Credit arranged. (F, W, Sp, Su)

Staff

**250. Research and Thesis.** Research connected with problems undertaken in animal science for partial fulfillment of requirements for the Master of Science or Doctor of Philosophy degree. Credit arranged. (F, W, Sp, Su)

Staff

**261. Animal Nutrition Seminar.** Special emphasis will be given to discussions of topics related to animal nutrition. May be repeated. (1F, 1W, 1Sp)

Staff

**262. Animal Breeding Seminar.** Special emphasis will be given to discussion of topics related to animal breeding. May be repeated. (1W)

Staff

**263. Animal Management Seminar.** Special emphasis will be given to discussion of topics related to the management of livestock. May be repeated. (1Sp)

Staff

**264. Animal Physiology Seminar.** Special emphasis will be given to discussion of topics related to reproductive physiology. May be repeated. (1F, 1W, 1Sp)

Staff

**270. Nutrition and Biochemistry Seminar.** Reports and discussion of topics of current interest and importance by students, staff, and guest speakers. Philosophy of research and technical information are included. Area of coverage rotates each quarter. Course enrollment may repeat each quarter. (1F, W, Sp)

Staff

\*\*Taught 1969-70

## Department of

# Dairy Science

**Head:** Professor George E. Stoddard  
Office in Animal Science 106

**Professors** Lloyd R. Hunsaker, Vearl R. Smith; **Associate Professor** John J. Barnard; **Assistant Professors** Clive W. Arave, Charles H. Mickelsen; **Research Assistant** LaMon Perks; **Collaborators** Melvin J. Anderson, Robert C. Lamb.

**Degrees:** Two-year Program Certificate of Completion, Bachelor of Science (BS), Master of Science (MS).

**Major:** Dairy Science with emphasis in Science, Business, or General Dairy Science.

Students in Dairy Science may select training in a general, science or business curriculum with optional course development in

breeding and genetics, nutrition, management, pre-veterinary, economics or other specialities offered at the University. Practical

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dairy farm experience is considered essential for the general and business curricula and highly desirable for the science curriculum before being graduated with a Bachelor of Science degree.

In the science curriculum, specialized training is provided in nutrition and in breeding. Those completing a science training prepare themselves for such job opportunities as laboratory technicians, industry consultants and further training as graduate students.

The business curriculum provides training in business methods and economic principles in preparation for managing personally owned or commercial dairy farms and the many allied businesses, such as equipment and supply companies, feed mills and artificial insemination units.

A general curriculum provides training for those who plan to manage a dairy farm or work with those who manage a dairy farm. Fieldmen, Extension employees and artificial insemination specialists are typical positions for those trained within the general curriculum.

### Undergraduate Study

A two-year course in Dairy Science leading to a Certificate of Completion is offered. This course is available to train students for efficient dairy production who do not wish to complete the four year course leading to the Bachelor of Science degree.

Additional information concerning required courses can be obtained from the department.

Suggested course of study for the first two years for Dairy Production Curricula:

#### FRESHMAN YEAR

Course	Credits
English 1, 2, 3 .....	9
Biology 15 .....	5
Zoology 16 .....	5
Bacteriology 70 .....	4
Veterinary Science 20 .....	5
MS, AS, or PE .....	3
Humanities or Social Science (group) .....	15
Electives .....	5
	<hr/> 51

#### SOPHOMORE YEAR

Course	Credits
Agricultural Economics 71, 72, 73 .....	9
Math 34, 35, 44 <sup>1</sup> or 46 <sup>1</sup> .....	8-13
Dairy Science 51 .....	2
Food Science 6 .....	5
Chemistry 20 <sup>1</sup> , 21 <sup>1</sup> , 22 <sup>1</sup> or 10, 11, 12 .....	15
Humanities or Social Science (group) .....	7
Electives .....	8-3
	<hr/> 54

Suggested course of study for the Junior and Senior years in the Science Curriculum:

#### Dairy Cattle Nutrition Option:

Course	Credits
Zoology 112 .....	5
Animal Science 150, 151 .....	6
Dairy Science 110, 112, 120, 121, 122, 215 .....	27
Food Science 130 .....	5
Bacteriology 104 .....	3
Chemistry 115, 121, 122, 180 .....	17
Physics 6 or 17, 18, 19 or 20, 21, 22 .....	5-15
Veterinary Science 120 .....	4
Electives .....	33-23
	<hr/> 100-105

#### Dairy Cattle Breeding Option:

Course	Credits
Zoology 112, 118 .....	10
Animal Science 150, 151 .....	6
Dairy Science 110, 112, 120, 121, 122, 215 .....	24
Bacteriology 104 .....	3
Chemistry 121, 122 .....	8
Math 96, 97, 98 .....	15
Applied Statistics 51 .....	4
Veterinary Science 120 .....	4
Veterinary Science 150 or Physiology 142 .....	3
Electives .....	23
	<hr/> 100

Suggested course of study for the Junior and Senior years in the Business Curriculum:

<sup>1</sup>These courses are required in the Science curriculum. They are recommended but not required in the other curricula.



**Dairy Cattle Business Option**

Course	Credits
Zoology 112 .....	5
Animal Science 150, 151 .....	6
Dairy Science 110, 112, 120, 121, 122, 215 .....	24
Bacteriology 104 .....	4
Veterinary Science 120 .....	4
Accounting 1, 2, 3, Business Administration 4, 63, 133, 143, 171 .....	24
Economics 51 .....	5
Agricultural Economics 163 .....	3
Electives .....	25
	100

Suggested course of study for the Junior and Senior years in the Dairy Production General Curriculum:

Course	Credits
Zoology 112 .....	5
Animal Science 150, 151 .....	6
Dairy Science 110, 112, 120, 121, 122, 215 .....	22
Bacteriology 104 .....	4
Veterinary Science 120, 150 .....	7
Plant Science 103, 119 .....	8
Soils 56 .....	4
Agricultural Engineering 10 or 110 .....	3-5
Entomology 108 .....	5
<sup>1</sup> Directed Electives .....	21
Electives .....	15
	100-102

**Graduate Study**

The Dairy Science Department offers a Master of Science degree in Dairy Production. The Master of Science degree is acceptable by other universities toward further study on a PhD degree. Students may work on a Master of Science or a PhD degree in the Nutrition and Biochemistry Interdepartmental Curriculum as outlined in this catalog under School of Graduate Studies.

**Dairy Courses**

2. **Introductory Dairying.** Considers the history of the dairy industry. An introductory study is made of starting dairy herds; breeds of dairy cattle; cow testing associations; herd records, calf feeding, and general feed-

ing. Composition of milk, factors that affect it; practical composition and quality tests; farm dairy machines; production of quality milk; dairy arithmetic. Practical skills emphasized. (4W) **Larsen, Arave**

51. **Dairy Cattle Judging and Evaluations.** Types of various breeds of dairy cattle, judging individual animals, showing, type classification, type and production relations. Visits to dairy farms. (2Sp) **Arave**

110. **Dairy Production.** Growth and development of dairy heifers; herd management systems; housing and equipment; disease control; sanitation and quality milk production, economy in dairy farming; sire and heifer management. (5Sp) **Arave**

\*112. **Feeding Dairy Cattle.** Characteristics of standards and feeding systems. Economy and comparative value of feeds on irrigated farms. Prerequisites: An Sci 150, 151. (3W) **Stoddard**

\*\*120. **Dairy Cattle Breeds and Breeding.** Studies of the inherited characteristics of dairy cattle to be considered in selecting breeding stock. Breeding programs and systems in use. Breeds of dairy cattle, breed organizations and their programs, testing plans, pedigree analysis, record keeping and study of breeding establishments. Prerequisite: Zoology 112. (5W) **Arave**

\*121. **Milk Secretion.** Anatomy and function of the mammary gland, theories of secretion, methods of milking, mastitis control, factors affecting composition, quality and quantity of milk. Prerequisite: Organic Chemistry. (3W) **Smith**

122. **Dairy Herd Management and Operation.** Dairy herd management, land-livestock balance, operational efficiencies, herd improvements, new developments and trends, and critical analysis of dairy literature. Student discussions and reports. (Open to seniors in Dairy Production or by permission of instructor.) (3Sp) **Stoddard**

220. **Research in Dairy Science.** Credit arranged. (F, W, Sp, Su) **Staff**

254. **Special Problems in Dairy Science.** Credit arranged. (F, W, Sp, Su) **Staff**

**Nutrition and Biochemistry Seminar.** See Animal Science 270.

<sup>1</sup>Directed electives to be selected in consultation with Head of the Department to meet projected employment plans of each student.

\*Taught 1968-69

\*\*Taught 1969-70

Department of

## Food Science and Industries

**Head:** Professor C. A. Ernstrom  
Office in Animal Science 212

**Professors** D. R. Morgan, G. H. Richardson, D. K. Salunkhe, Ethelwyn B. Wilcox; **Associate Professor** Paul B. Larsen; **Assistant Professor** L. Elmer Olson; **Research Assistant** Archie Hurst.

**Degree:** Bachelor of Science (BS).

**Major:** Food Science with emphasis in Business, Engineering, or Science.

Food processing, packaging and distribution constitute one of America's largest industries. There is a critical shortage of technically trained personnel. Excellent opportunities exist for graduates who are prepared for either domestic or foreign service in Food Science.

The Department of Food Science and Industries offers undergraduate education leading to a Bachelor of Science degree. Master of Science and Doctor of Philosophy degrees in Food Science may be obtained through an interdepartmental program.

Excellent relations exist between this department and food processing companies, which provide summer employment for departmental majors. This gives an opportunity for students to gain practical experience in food processing operations prior to graduation.

Majors in the Department of Food Science and Industries may obtain their BS degrees under a science curriculum, business curriculum, or engineering curriculum. Within each curriculum there is opportunity for specialization in dairy manufacturing, meat processing, or fruit and vegetable processing.

Students who follow the **Science** option receive strong background

training in chemistry, bacteriology, and physics. Graduates are particularly qualified to enter graduate school and pursue advanced degrees. They are also in demand by industry for positions in quality control, research, product development and production; and by federal and state control laboratories.

The **Business** option provides training in business methods and economic principles that prepare graduates to enter management training programs of food processing companies. Graduates of the business curriculum also find employment in sales, marketing, and in allied businesses such as food industry supply firms. They also find employment in federal, state and local food regulatory agencies.

Graduates from the **Engineering** option are especially sought by designers and manufacturers of food processing equipment. These students become involved in process development and equipment design. Graduates with this specialized training are few in number, and are in great demand.

## Lower Division

FRESHMAN YEAR		
Courses		Credits
English 1, 2, 3 .....		9
Math 35 .....		5
Biology 15 .....		5

Economics 51 .....	5
Food Science and Industries 15 .....	3
Bacteriology 70 .....	5
PE, MS or AS .....	3
Option Requirements .....	10-15
	45-50

### Science Option

Math 46, 96, Zoology 16, Botany 26, or Physiology 4 .....	15
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### Business Option

Economics 52, Zoology 16, Botany 26, or Physiology 4 .....	10
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### Engineering Option

Math 96, 97, ME 6, 21 .....	15
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### SOPHOMORE YEAR

Courses	Credits
Food Science and Industries 50 .....	2
Food Science and Industries 60 .....	5
Food and Nutrition 22 .....	3
Social Science and Humanities .....	10-14
Option Requirements .....	24-29

### Science Option

Chemistry 20, 21, 22; Math 97 Applied Statistics 51 .....	24
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### Business Option

Chemistry 10, 11, 12 Accounting 1, 2, 3 Business Administration 20 or 63 .....	26-27
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### Engineering Option

Math 98, 99 Physics 20, 21; Civil Engineering .....	24
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### JUNIOR YEAR

Courses	Credits
Food Science and Industries 100 .....	5
Bacteriology 104, 105, 120, 121 .....	9
1Food Processing .....	5
Option Requirements .....	22-29
2Electives .....	0-6

### Science Option

Chemistry 115, 121, 122 Physics 17, 18, 19 .....	27
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### Business Option

Physics 6 Business Administration 4, 5, 6, 133, 143, 151 .....	22
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### Engineering Option

Chemistry 10, 11, 12; Physics 22 Math 110; Civil Engineering .....	29
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### SENIOR YEAR

Courses	Credits
Food Science and Industries 130 .....	5
1Food Processing .....	15
Food Science and Industries 180 .....	2
Option Requirements .....	5-14
2Electives .....	9-18

### Science Option

Chemistry 180 or 190 .....	5
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### Business Option

Business Administration 150, 171 .....	10
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### Engineering Option

Electrical Engineering 71 Mechanical Engineering 11, 116, 117 .....	14
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### Food Science and Industries Courses

5. **Judging Dairy Products.** Methods and practice in judging dairy products for market and show. (2Sp) **Larsen**

15. **World Food: Demand and Supply.** The course develops an understanding among students of the economic, political, and social implications of the world's disparity between food supply and food requirements. Factors which inhibit food production, problems which cause food spoilage and waste, and possible solutions to such problems will be discussed. The policies of national and international agencies which direct their activities at food and agricultural problems throughout the world will be presented. The course encourages better understanding of world unrest by giving insight to students on one of the most critical problems. (3W) **Salunkhe**

50. **Food Standards and Regulations.** A study of the history, importance, and make-up of food standards and regulations as established by various city, state, federal, and international governmental agencies. Recent trends are emphasized. (Sp) **Richardson**

60. **Market Milk.** Modern sanitary methods of producing, processing, and marketing milk, cream, and related products. (5W) **Larsen**

100. **Food Analysis.** Application of quantitative and qualitative techniques to the determination of composition and quality of food products. Prerequisites: Chemistry 12 or 22. (5F) **Richardson**

1Food Processing courses may be selected from the following: FS and I 101, 103, 104, 105, 139, 140.

2Suggested Electives: F and N 107, 108, 109, 143. Bact. 180, Pub. Health 150. FS and I 5, Dy Science 121.

**101. Ice Cream and Ices.** Purchase of raw materials. Chemical and physical structure of an ice cream mix and its relation to the finished product. Standardizing, processing, freezing and merchandising commercial ice cream, sherberts and ices. Refrigeration mechanics of commercial ice cream plants. (5Sp)

**Ernstrom**

**103. Cheese.** Methods of curd formation and conversion of curd to various varieties of cheese. Mechanics of cheese making. Chemistry and microbiology of cheese curing. Classification, statistics, marketing, and factory organization. (5F)

**Ernstrom**

**104. Concentrated Milks and Butter.** Factors involved in the manufacture of concentrated milk products and butter. Consideration is given to plant processes, equipment and the chemical, physical and bacteriological aspects relating to quality. (5F)

**Larsen**

**105. Management and Operation of Dairy Plants.** Personnel problems, advertising, selling, managerial use of records, and other principles underlying successful management and operation are considered. All operations of the creamery are conducted by this class. (5Sp)

**Larsen**

**130. Dairy Chemistry.** A study of the composition, structure, and properties of milk and its constituents, and the chemistry of changes that occur during the processing of milk for utilization as food. Prerequisite: Chemistry 12 or 122. (W)

**Ernstrom**

**139. Food Technology I.** Storage and transportation of horticultural crops. Will give emphasis to post harvest physiology and storage diseases of fruits and vegetables. Will include biotics, radiation, transportation, and distribution. Prerequisites: Bacteriology 70; Chemistry 20, 21, 22 or 10, 11, 12; Botany 26, 130; Plant Science 1, 4; or special permission. Three lectures, one lab. (4F)

**Salunkhe**

**140. Food Technology II.** Processing of horticultural crops. History and methods of commercial preservation of fruits and vegetables by canning, freezing, drying, pickling, and radiation, juice concentrates, and syrups; packaging, organoleptic appraisal, quality control, and sales promotion. Prerequisites: Bacteriology 70; Chemistry 20, 21, 22 or 10, 11, 12; or by special permission. Three lectures, one lab. (4F)

**Salunkhe**

**180. Seminar.** Discussion and reports on current Food Science topics. (1F, W, Sp)

**Staff**

**200. Research and Thesis.** Research in Food Science and preparation of thesis. Credit arranged. (F, W, Sp, Su)

**Staff**

**210. Special Problems.** Special laboratory investigations or library searches on current food science problems. Credit arranged. (F, W, Sp, Su)

**Staff**

**220. Graduate Seminar.** Discussions and reports by graduate students. (1F, W, Sp)

**Staff**

**241. Food Technology III.** Biochemistry and Microbiology of Horticultural Products. The basic composition, structure, and properties of fruits and vegetables. Nutritional and biochemical changes occurring subsequent to harvest and during transit, storage, and processing of fruits and vegetables. Relationship of habitat to occurrence of microorganisms on harvested, stored, and processed fruits and vegetables. Environmental factors, influencing the growth of microorganisms on fresh and processed horticultural crops. Interpreting and integrating published data in the area with basic principles of biochemistry and microbiology. Prerequisites: Food Technology I, II; Chemistry 190; Bacteriology 120; Botany 150. Three lectures, one lab. (4Sp)

**Salunkhe**

<sup>1</sup>Taught in behalf of interdepartmental curriculum in Food Science and Technology.

## Department of

# Plant Science

**Head: Professor Frank B. Salisbury**  
Office in Agricultural Science 322

**Professors** Keith R. Allred,<sup>1</sup> J. Clark Ballard,<sup>1</sup> William H. Bennett, Wade G. Dewey, Alvin R. Hamson, K. W. Hill, DeVere R. McAllister, Leonard H. Pollard<sup>1</sup>, Arvil L. Stark, David R. Walker; **Professor Emeritus** D. C. Tingey; **Associate Professors** J. LaMar Anderson, Glenn T. Baird, Louis A. Jensen, Rex F. Nielson, Golden L. Stoker, Gordon A. Van Epps;<sup>1</sup> **Assistant Professors** John O. Evans, Bernard G. Wesen-



berg; **Research Associates** Alice Denney, Hussein I. El-Mansy, Robert K. Gerber; **Farm Superintendents** Rulon P. Draper, Percy Johnson, William Nay, Dean S. Thompson; **Collaborators** Douglas R. Dewey, Alvin C. Hull, Wesley Keller, Earl H. Ottley, Marion W. Pedersen, George K. Ryser, Clifton H. Smith, Myron Stout, J. Clair Theurer, A. Lee Urie.

**Degrees:** Bachelor of Science (BS), Master of Science (MS), Doctor of Philosophy (PhD).

**Majors:** Plant Nutrition, Crop Management, Plant Breeding, Crop Physiology, Agronomy, Horticulture, and Weed Science.

Study and research in Plant Science investigate not only basic aspects of plant function, but a constant goal is to apply this knowledge to the problem of crop production, especially in arid regions. Course offerings include studies of the inter-relationships of plants grown under a variety of conditions with particular emphasis on factors contributing to production of maximum quality and yield. Opportunity is provided for basic studies of these complex relationships in addition to application of increased knowledge to modern agriculture.

Bachelor of Science degrees are offered under a Science curriculum, a General curriculum, and a Business curriculum.

Please note that the introductory course, Plant Science 2, is a prerequisite to all other undergraduate Plant Science courses for all Plant Science majors. Non-majors may avoid this prerequisite by obtaining permission from the instructor.

## Undergraduate Study

**Two-year program in Plant Science.** A two-year course in Plant Science leading to a Certificate of Completion is offered. This course is available to train students for efficient crop production who do not wish to complete the four-year course leading to a Bachelor of Science degree.

Additional information concerning required courses can be obtained from the department.

The Science curriculum offers the following options: Crop Nutrition and Physiology, Plant Breeding, and Weed Science. It is designed for students who are capable and have the desire to continue their education beyond the Bachelor's degree. It provides an excellent background in science supplemented with selected courses in production and management. By choosing one of the options, students may take courses during their Senior year that will better prepare them for graduate work in their field of specialization. In addition, students graduating in the Science curriculum are qualified for positions in industry, education, or with federal or local governmental organizations.

**Science Curriculum.** Students in any of the three science options take the following courses:

### FRESHMAN YEAR

Course	Credits
Plant Science 2 .....	4
<sup>1</sup> Plant Science Courses .....	5
English 1, 2, 3 .....	9
Math 34, 35, 46 .....	13
Biology 15 .....	5
Botany 26 .....	5
Bacteriology 70 and 72 .....	5
MS, AS, or PE .....	3
	49

### SOPHOMORE YEAR

Course	Credits
Plant Science Course .....	3
Chemistry 20, 21, 22 .....	15

<sup>1</sup>On leave.

## 56 College of Agriculture

Physics 6 .....	5
Soils 56 .....	4
Geology 3 .....	5
Social Science electives (see group requirements) .....	8
*Humanities electives (see group requirements) .....	12
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### JUNIOR YEAR

Course	Credits
Plant Science upper division courses .....	11
Math 96, 97, 98 .....	15
Chemistry 121, 122 .....	10
Soils 105 .....	3
Zoology 112 .....	5
Botany 120 .....	5
Social Science electives (see group requirements) .....	3
	<hr/> 52

### SENIOR YEAR

Course	Credits
<b>Crop Nutrition and Physiology</b>	
Plant Science 109, 131 .....	10
Plant Science 199, 199, 199 .....	3
Statistics 131, 132 .....	8
Botany 130 .....	5
Chemistry 115 .....	5
Soils 155, 156 .....	4
Entomology 108 .....	5
English 111 .....	3
Electives .....	10
	<hr/> 53

### SENIOR YEAR

Course	Credits
<b>Plant Breeding</b>	
Plant Science 109, 131 .....	10
Plant Science 199, 199, 199 .....	3
Statistics 131, 132, 134 .....	12
Botany 130 .....	5
Entomology 108 .....	5
English 111 .....	3
Electives .....	14
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## General Curriculum

Students interested in the general curriculum will follow the plan of courses outlined below. With some modification in the plan they can qualify in either Agronomy or Horticulture.

Special training can be taken in the areas of Field Crop Production and Management, Weed Control, Turf Management, Fruit Crops, Vegetable Crops, and Ornamental Plants.

This curriculum prepares a student for positions in farming, as a farm manager, farm planner, or as a field man in industry, in the agricultural extension service, or with federal, state or local governmental organizations.

## General Curriculum:

### FRESHMAN YEAR

Course	Credits
Plant Science 2 .....	4
<sup>1</sup> Plant Science Option Courses .....	2
English 1, 2, 3 .....	9
Biology 15 .....	5
Botany 26 .....	5
Math 34, 35, 46 .....	13
MS, AS, or PE .....	3
Group Electives .....	3
Ag Economics 72, 73 .....	6
	<hr/> 50

<sup>1</sup>Agricultural Economics 71, 72 or 73 may be taken in place of one Plant Science course.

<sup>2</sup>Should include Landscape Architecture 3 or Plant Science 118.

### SOPHOMORE YEAR

Course	Credits
<sup>1</sup> Plant Science Option Courses .....	6
Animal Science .....	3
Chemistry 10, 11, 12 .....	15
Soils 56 .....	4
Bacteriology 70 and 72 .....	5
Group Electives (Geology 3, Landscape Arch 3) .....	18
	<hr/> 51

### JUNIOR YEAR

Course	Credits
<sup>1</sup> Plant Science Option Courses .....	11
Entomology 108 .....	5
Agricultural Engineering 110 .....	3
Soils .....	3
Botany 120 .....	5
Group Electives .....	24
	<hr/> 51

### SENIOR YEAR

Course	Credits
Plant Science 199, 199, 199 .....	3
Plant Science 131 .....	5
<sup>1</sup> Plant Science Option Courses .....	33
Zoology 112 .....	5
Botany 130 .....	5
	<hr/> 51

## Plant Science Major Courses:

**Agronomy.** Plant Science 104 or 117 and 103, 107, 108, 109, 119, 120; Soils 105, 106, 155, 156, 114;

and one additional animal course.

**Horticulture.** Majors in Horticulture will be selected from the following courses: Plant Science 11, 100, 104, 105, 109, 111, 117, 118, 119; Meteorology 17; Soils 107; Entomology 120; Landscape Architecture 3; and Botany 102.

## Graduate Study

**Master of Science Degree.** The Department, in cooperation with related departments, offers Master of Science programs in Plant Breeding, Crop Physiology, Crop Production and Management, Weeds and Weed Control, Food Technology, and Plant Nutrition. A Master of Science degree in the Department is accepted by most other universities as equivalent to a year's work toward a Doctor of Philosophy degree in the major subject.

Upper division courses acceptable for graduate credit toward the Master of Science degree in Plant Science are: Plant Science 109, 120, 130, 131, and 140.

**Doctor of Philosophy Degree.** The Department, in cooperation with related departments, offers the degree of Doctor of Philosophy in Plant Nutrition, Crop Management, Food Technology, Plant Breeding, and Crop Physiology. Detailed information may be obtained from the Department or from the Dean of the School of Graduate Studies. (Also see Catalog, School of Graduate Studies.)

## Plant Science Courses

### 2. Introduction to Agricultural Plant Science.

A survey of the practices of agricultural plant science, designed as an introduction for majors in the field and as a fairly complete summary for non-majors. Includes discussions of world crops, soil and crop management, and topics relating to modern developments, such as plant breeding and propagation, use of agricultural chemicals, food technology, turf, and controlled environments (greenhouses and phytotrons). Three lectures and one special events period. (4F) **McAllister**

**11. Garden Flowers.** Identification, culture and landscape use of bulbs, annuals and perennials. (3Sp) **Wesenberg**

**100. Propagation, Pruning, and Grafting.** A practical course for all students in the University, dealing with the science and art of pruning and grafting of horticultural plants. Methods of asexual propagation will be considered. Special emphasis is placed on fruit trees, but the small fruits and ornamental trees and shrubs are also included. (3W) **Walker**

**103. Forage Crops.** Alfalfa, clovers, grasses and other farm forages, classification and methods of production, harvesting and storage, meadow and pasture management. The place of forage crops in rotations and soil conservation is considered. Three lectures, one lab. Prerequisites: Botany 26, Plant Sc. 2 (majors). (4Sp) **McAllister**

**\*\*104. Vegetable Production.** Principles and practices underlying production of vegetable crops, varieties, fertilizers, pest control, harvesting, storage, and processing of vegetables. Emphasis will be placed upon culture of the major vegetable crops. Three lectures. (3Sp) **Hamson**

**105. Turf Management.** Kinds of turf grasses, their fertility and management, for home lawns, golf courses, and athletic fields. (2Sp) **Evans**

**107. Grain Crops.** The classification, history, and cultural methods involved in the production of grain crops. Two lectures, one lab. Prerequisite for majors: Plant Science 2. (3W) **Evans**

**108. Root and Miscellaneous Crops.** Cultural methods, market grades and commercial possibilities of sugar beets, potatoes, tobacco, and other crops. Prerequisite for majors: Plant Science 2. (3F) **McAllister**

**\*\*109. Plant Breeding.** Principles, techniques, and practices in breeding improved varieties of crop plants. Prerequisite for majors: Zoology 112, Plant Science 2. (4W) **Dewey**

**111. Ornamental Horticulture.** A study of the aesthetic use of plants, including foliage plants and cut flowers for indoor use and landscape materials for enhancing the home and community. Topics are organized around the controlled-environment culture of florists crops (greenhouse management) and the propagation and nursery practices required to produce landscape materials (shrubs, trees, evergreens, and bedding plants). (3Sp) **Wesenberg**

<sup>1</sup>Agricultural Economics 71, 72 or 73 may be taken in place of one Plant Science course.

**\*\*Taught 1969-70.**

**\*\*115. Dry Farming.** Principles of dry farming from practical and scientific standpoints, a survey of agricultural work in the Great Plains and the mountain regions, an analysis of the possibilities in typical climatic areas and on important soil types. Prerequisites: Plant Science 2 (majors), 107, and Soils 56. (2W) **McAllister**

**117. Fruit Production.** Principles and practices underlying production of trees and small fruits. Varieties, soils, sites, fertilizers, culture, pest control, harvesting, storage, propagation and stocks. Prerequisite for majors: Plant Science 2. (3F) **Anderson**

**118. Flower Arranging for the Home.** Principles of design, care and use of floral materials in arrangements and corsages. House plant care. Lab fee required. (3F) **Wesenberg**

**119. Weed Science.** Identification of weeds, the weed problems in agriculture, and methods of control. Three lectures, one lab. Prerequisite for majors: Plant Science 2. (4F) **Anderson**

**\*120. Seed Production.** Methods, problems and commercial production of field, vegetable, and flower seeds in the Intermountain West. Prerequisite: Plant Science 2, Botany 26 or permission of instructor. (4F) **McAllister**

**131. Agricultural Sprays and Dusts.** Preparation, properties, and uses of agricultural chemicals used in disease, insect, and weed control; application of fruit thinning, growth regulator, and nutritional sprays. Design, operation, and care of the application equipment. Jointly administered by the Departments of Botany, Plant Science, and Zoology. Prerequisites: Botany 130, Entomology 108 or special permission. Three lectures, two labs. (5Sp) **Anderson, Cannon, Davis**

**197. Special Problems.** Conferences or laboratory investigations. Subject and credit arranged. **Staff**

**199. Seminar.** Review and discussion of current agronomic problems, practices, and available employment. Required of all seniors in department. One lecture. (1F, W, Sp) **Staff**

**\*201. Hays and Pastures.** Recent advances in current problems related to the production and use of hays and pastures. Prerequisite: Plant Science 103 or equivalent. (3Sp) **Evans**

**\*204. Advanced Vegetable Production.** Fundamental principles relating to technical horticultural practices in vegetable crop production, seed storage, growth and development, nutrition, water relations, temperature, light, photoperiod, weed control and growth regulators. Prerequisite: Plant Science 104. (4W)

**Hamson**

**\*\*208. Advanced Field Crops.** Recent advances in the improvement and production of cereal, potato and sugar beet crops. Prerequisites: Plant Science 107 and 108. (3W)

**McAllister**

**\*209. Advanced Plant Breeding.** A graduate course emphasizing the principles and theory underlying plant breeding, rather than procedures and methodology. Including discussion of quantitative inheritance, heritability, heterosis, interspecific crossing, mutation breeding, and others. Emphasizes recent developments and current trends. (3W) **Dewey**

**\*217. Advanced Pomology.** Fundamental principles relating to horticultural practices; growth and development, nutrition, water relations, fruit setting, dormancy and use of growth regulators in fruit production. Prerequisites: Botany 120 (or concurrent registration), organic chemistry, Plant Science 117. Three lectures, one lab. (4Sp) **Walker**

**\*219. Biochemical Basis of Herbicidal Action.** Entrance, movement and metabolism of chemicals of herbicidal importance in plants. A critical study of the physiological processes which appear to be affected by the several classes of compounds used as herbicides. Prerequisites: Botany 120, Chemistry 190. (3Sp) **Evans**

**\*\*222. Control of Reproduction in Plants.** A discussion of the ways in which flower, fruit, and seed production can be controlled in horticultural and agronomic crops, including the topics of vegetative propagation, vernalization, and photoperiodism. An emphasis upon principles and their application in modern agriculture. Prerequisite: Botany 120. (3Sp)

**Salisbury**

**\*\*260. Methods in Plant Science Research.** Research methods using chromatography, radioisotopes, experimental plot design and instrumental analysis. Prerequisites: Chemistry 122, Botany 120, Applied Statistics 132. One lecture, one lab. (2W) **Staff**

**297. Special Problems.** Any quarter. Credit arranged. Registration by permission only. **Staff**

**298. Research and Thesis.** Any quarter. Outlining and conducting research on farm crops and preparation of thesis. Credit arranged. **Staff**

**299. Graduate Seminar.** Oral and written reports by graduate students. Registration required for all departmental graduate students. (1F, W, Sp) **Staff**

\*Taught 1968-69

\*\*Taught 1969-70



Department of

# Soils and Meteorology

**Acting Head: Professor R. L. Smith**  
Office in Agricultural Science 148

**Professors** Paul D. Christensen, R. J. Hanks, Jerome J. Jurinak, Raymond W. Miller, George W. Reynolds, D. Wynne Thorne; **Associate Professors** Gaylen L. Ashcroft, Ben L. Grover, Alvin R. Southard; **Associate Professor Emeritus** LeMoyne Wilson; **Research Associate** Reuel E. Lamborn; **Research Assistant** Melvin D. Campbell; **Collaborators stationed at USU** J. L. Haddock, Dean C. Hirschi, E. Arlo Richardson, Ronald K. Tew; **Collaborators stationed at Snake River Laboratory, Kimberly, Idaho**, David L. Carter, John W. Cary, Glen E. Leggett, Henry F. Mayland, J. H. Smith, James L. Wright.

**Degrees:** Bachelor of Science (BS), Master of Science (MS), Doctor of Philosophy (PhD).

**Majors:** Soil Science, Soil and Water Conservation, Soils and Irrigation, General Soils, Industrial Soils and Agricultural Chemistry, Biometeorology and Climatology.

The Soils and Meteorology research laboratories at USU are world-renowned in soil chemistry, soil classification, soil and plant nutrition, soil physics, soil salinity, soil testing and micrometeorology. Latest equipment and facilities are available for studying the composition of soil and plant materials, the retention and movement of water and other materials through soils and plants, evapotranspiration, the reactions of pesticides in the soil, plant nutrition, the influence of soil and atmospheric environment on plants and animals, fertility requirements, water quality, trace elements, and the use and conservation of soil, atmospheric and water resources.

Advanced undergraduate students are given the opportunity to work with staff members and graduate students on original research projects. Emphasis is upon problems connected with arid to subhumid soil and climate complex that is characteristic of the intermountain and Great Basin region.

## Undergraduate Study

Majors must have a grade point

of 2.5 or better in all Soils and Meteorology courses. Any Soils or Meteorology course passed with a "D" grade must be repeated. Transfer students are required to take at least 15 credits of the major in residence at USU.

## Soil Science Curriculum

The Science curriculum affords choices in either Soil and Water Conservation, Soils and Irrigation (administered jointly with the Department of Agriculture and Irrigation Engineering), or Soil Science. A student graduating with either of the three Soil Science options is well equipped to do either applied or graduate work, and to assist in soil and water research and utilization programs. Students who select the science curriculum meet the requirements of the Soil Science Society of America for certification as a soil scientist and can qualify for Civil Service positions as a soil scientist or conservationist. In addition, a student graduating with the Soil and Water Conservation option is well trained in

hydrology and equipped for positions with a number of federal, state and local governmental and civic organizations in planning and supervising the use of soil and water for a multitude of uses.

A student selecting the Soils and Irrigation option is trained to manage and operate irrigation systems and installations and to work for extension and conservation organizations as irrigation specialists. The opportunities for foreign service are particularly good for this option.

Students selecting Soil Science are prepared for many kinds of soil science positions in connection with agriculture, forestry, range science, engineering, and education.

All students in the science curriculum take the first three years in common.

**FRESHMAN YEAR**

Course	Credits
English 1, 2, 3 .....	9
Meteorology 17 .....	3
Math 35, 46, 96 .....	15
Chemistry 20, 21, 22 .....	15
Social Science (group requirements) .....	8
MS, AS, or PE electives .....	3
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**SOPHOMORE YEAR**

Course	Credits
Math 97, 98, 99 .....	15
Soils 56 .....	4
Biology 15 .....	5
Botany 26 .....	5
Geology 3 .....	5
Social Science (group requirements) .....	6
<sup>1</sup> Humanities (group requirements) .....	11
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**JUNIOR YEAR**

Course	Credits
Soils 105, 106, 107, 155, 156, 114 .....	15
Physics 17, 18, 19 or 20, 21, 22 .....	15
English 111 or 113 .....	3
Agricultural and Irrigation Engineering 110 or 143 .....	3
<sup>2</sup> Electives .....	15
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**SENIOR YEAR****Soils and Irrigation Option**

Course	Credits
Soils 165, 166, 111 .....	5
Meteorology 125 .....	3
<sup>3</sup> Electives .....	20
<sup>4</sup> Earth Science electives .....	5
Additional credit electives .....	15
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<sup>1</sup>Electives should include Landscape Architecture 3, if possible.

<sup>2</sup>For Soil and Water Conservation, the electives should include Range Science 126 and Animal Science 10. For Soils and Irrigation it should include Civil Engineering 81 or 84 and Industrial and Technical Education 80 and 81. For Soil Science it should include Soils 110. Bacteriology 70 and 72 are also strongly recommended.

<sup>3</sup>Recommended electives: For this option students must choose three of the following courses: Agricultural and Irrigation Engineering 108, 145, 147, 148, 149, 160. Other courses may be chosen from Entomology 108, Botany 120, 130; any upper division course in Plant Sciences; Range 180; Applied Statistics 131, 132; Civil Engineering 173.

<sup>4</sup>Should be upper division Math, Chem, or Physics.

**Soil and Water Conservation Option**

Course	Credits
Soils 165, 166, 111 .....	5
Meteorology 125 .....	3
Civil Engineering 173 .....	3
<sup>5</sup> Electives .....	20
<sup>6</sup> Additional credit electives .....	17
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**Soil Science Option**

Course	Credits
Soils 165, 166, 111 .....	5
Meteorology 125 .....	3
Chem 115 .....	4
<sup>7</sup> Electives .....	19
<sup>8</sup> Additional credit electives .....	17
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**General Soil Curriculum**

A major in General Soils prepares the student for positions in the Agricultural Extension service, and as a farm planner, field man or farm manager with commercial companies or as a conservationist in the U.S. Civil Service.

FRESHMAN YEAR

Course	Credits
English 1, 2, 3 .....	9
Biology 15 .....	5
Botany 26 .....	5
Math 34, 35, 44 (or 46) .....	11
Landscape Architecture 3 (Social Science) .....	3
Geology .....	5
MS, AS, or PE .....	3
<sup>1</sup> Humanities (group requirements) .....	3
<sup>2</sup> Biological Science electives .....	3-5
	47-49

SOPHOMORE YEAR

Course	Credits
Agricultural Economics 71, 72, 73 .....	9
Chem 20, 21, 22 or 10, 11, 12 .....	15

<sup>5</sup>Recommended electives: Range Science 131, 132, 180; 5 credits upper division Chem, Math, or Physics; Applied Statistics 131, 132; Botany 120 or 108, 102; Forestry Science 114, 115, 141.

<sup>6</sup>Recommended added electives: Any in footnote 1 above; Geology 101, 102, 115, 117; Meteorology courses; Plant Science upper division courses.

<sup>7</sup>Recommended electives: Botany 120 and any other upper division courses in Botany or Plant Sciences; Applied Statistics 131, 132, 134.

<sup>8</sup>Recommended additional electives: Any in footnote 3 above; Geology 115 or 117; Soils 167, 177; any upper division courses in Math, Chem, Meteorology or Physics.

Meteorology 17 .....	3
Soils 56 .....	4
<sup>3</sup> Humanities (group requirements) .....	5
<sup>3</sup> Social Science (group requirements) .....	8
<sup>4</sup> Biological Science electives .....	6-8
	50-52

JUNIOR YEAR

Course	Credits
Soils 105, 106, 114, 155, 156 .....	13
English 111 or 113 .....	3
Botany 120 .....	5
<sup>5</sup> Upper division Biological Science electives .....	8
<sup>6</sup> Electives .....	21
	50

SENIOR YEAR

Course	Credits
Soils 165, 166, 111 .....	5
Agricultural and Irrigation Engineering 110 .....	3
Plant Science 119 or 131 .....	5
<sup>5</sup> Upper division Biological Science electives .....	9
<sup>6</sup> Electives .....	15
<sup>7</sup> Additional credit electives .....	13
	50

<sup>1</sup>Some suggested courses to fill Humanities and Social Science group requirements are:

Ag Econ 71, Economics 51, Psychology 53, History 1-5 and Political Science 102. See lower division requirements for other permissible courses.

<sup>2</sup>Lower division Biological Science electives must include Animal Science 1 or 10. The balance may be chosen from Plant Science 1, 4, 7, 8 and 11.

<sup>3</sup>Some suggested courses to fill Humanities and Social Science group requirements are: Ag Econ 71, Economics 51, Psychology 53, History 1-5, and Political Science 102. See lower division requirements for other permissible classes.

<sup>4</sup>Lower division Biological Science electives must include Animal Science 1 or 10. The balance may be chosen from Plant Science 1, 4, 7, 8, and 11.

<sup>5</sup>Upper division Biological Science electives should be chosen from Botany 130; Plant Science 101, 102, 103, 105, 109, 116, 119, 120, 131; Zoology 112; Entomology 108.

<sup>6</sup>Some recommended electives: Soils 110, 167, and 177; Meteorology 125, 126; Applied Statistics 131, 132, 134; Chem 115; Botany 102; Range 126, 180; Geology 115, 117; Bus Admin 133, 171; Accounting 100; Ag Econ 102, 116, 145; courses in footnote 9; and additional upper division courses in Plant Science, Botany, Animal Science, Dairy Science, Range Science, and Meteorology.

<sup>7</sup>Besides courses listed in footnote 6, it is suggested that the student consider Art 53 or 57 (photography); Agricultural and Irrigation Engineering 108.

Business Curriculum in Soils

The Industrial Soils and Agricultural Chemistry Option will equip the graduate to handle jobs with commercial companies as general field men, managers, and as technicians. The training will prepare the graduate for employment in industries concerned with the manufacture and distribution of fertilizers, herbicides, fungicides and insecticides.

FRESHMAN YEAR

Course	Credits
English 1, 2, 3 .....	9
Biology 15 .....	5
Botany 26 .....	5
Math 34, 35 .....	8
Meteorology 17 .....	3
Economics 51 .....	5
Landscape Architecture 3 .....	3
Geology 3 .....	5
MS, AS, or PE .....	3
Humanities (group requirements) .....	3
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### SOPHOMORE YEAR

Course	Credits
Agricultural Economics 71, 72, 73 .....	9
Chemistry 20, 21, 22 or 10, 11, 12 .....	15
Accounting 100 .....	4
Soils 56 .....	4
Social Sciences (group requirements) .....	15
<sup>1</sup> Electives .....	13
	60

### JUNIOR YEAR

Course	Credits
Entomology 108 .....	5
Soils 105, 106, 155, 156 .....	8
Botany 120, 130 .....	10
Business Administration 133 .....	3
Meteorology 125 .....	3
Plant Science 131 or Chem 115 .....	5
Humanities (group requirements) .....	6
English 111 or 113 .....	3
<sup>1</sup> Electives .....	9
	52

### SENIOR YEAR

Course	Credits
Soils 165, 166, 111, 114 .....	10
Plant Science 119 .....	4
Business Administration 171 .....	5
<sup>1</sup> Electives .....	14
<sup>2</sup> Additional credit electives .....	15
	48

## Meteorology Science Option

The Science option in Meteorology affords a selection between Biometeorology and Climatology. A student graduating with either option has the sound scientific background training necessary for either applied or graduate work.

**Biometeorology Option.** Students selecting this option obtain a uniquely broad training which allows them to work across a wide spectrum of disciplines. Space research and an increasing appreciation of the earth's complex ecology are creating an urgent need for a wide range of information on the influence of weather and climate upon the production, reproduction, and behavior of living organisms.

The interdisciplinary training of Biometeorology prepares the student for positions in industry, with state or federal agencies, and at

universities. The types of job opportunities vary from basic research to applied work in both the laboratory and the natural environment of the forest, field, and desert. Biometeorology may be applied to such diverse disciplines as medicine, forestry, agriculture, entomology, ecology, plant or animal physiology, weather modification, and air pollution.

### FRESHMAN YEAR

Course	Credits
English 1, 2, 3 .....	9
Meteorology 17 .....	3
Social Science electives (group requirements) .....	8

<sup>1</sup>Some recommended electives: Bus Admin 143, 151, 183; Chem 22, 115, 121; Ag Econ 102, 116, 145; Plant Science 103, 105, 139; Bacteriology 10 or 70; Art 57 (photography); Soils 110, 167, 177; Agricultural and Irrigation Engineering 110; other courses in Animal Science, Dairy, Plant Science, and Veterinary Science.

<sup>2</sup>The University minimum of 186 credits is met without these additional credits. However, filling of these additional credits with recommended electives will greatly strengthen the student's education.

<sup>3</sup> Math 35, 96, 97 .....	15
Chemistry 20, 21, 22 .....	15
MS, AS, or PE electives .....	3

### SOPHOMORE YEAR

Course	Credits
Math 98, 99, 110 .....	13
Soils 56 .....	4
Biological Science electives (group requirements) .....	5
Social Science electives (group requirements) .....	3
<sup>4</sup> Humanities electives (group requirements) ..	11
<sup>5</sup> Physics 20, 21, 22 .....	15
	53

### JUNIOR YEAR

Course	Credits
Meteorology 120, 125, 130, 180 .....	11
Math 145 .....	3
<sup>6</sup> Upper division Biological Science electives .....	10
Soils 105 .....	3
<sup>7</sup> Electives .....	24
	51

### SENIOR YEAR

Course	Credits
Meteorology 111, 129, 131, 132, 133 .....	14
Soils 165 .....	3
<sup>8</sup> Electives .....	34
	51



**Climatology option.** Students graduating in Climatology will have a firm scientific training that will equip them to do graduate work in all phases of meteorology including Climatology and many other closely allied sciences. Graduates are also well prepared for positions in applied climatology and several other phases of applied and theoretical meteorology. Such positions are available with: federal, state, and municipal government agencies; universities; public utilities; private consulting firms; and many industries such as aerospace, construction, transportation, manufacturing, and mining.

<sup>3</sup>Students who have not completed sufficient high school mathematics will be required to take Math 34 and 46.

<sup>4</sup>Humanities electives that are particularly beneficial to a Meteorologist are: Speech 1 and 21, Landscape Architecture 3, or a foreign language.

<sup>5</sup>Students who have not completed Math 96 by the first quarter of the Sophomore year should substitute Physics 17, 18, 19.

#### FRESHMAN YEAR

Course	Credits
English 1, 2, 3 .....	9
Meteorology 17 .....	3
Social Science electives (group requirements) .....	8
<sup>2</sup> Math 35, 96, 97 .....	15
Chemistry 20, 21, 22 .....	15
MS, AS, or PE electives .....	3
	53

#### SOPHOMORE YEAR

Course	Credits
Math 98, 99, 110 .....	13
Meteorology 125 .....	3
Biological Science electives (group requirements) .....	5
Social Science electives (group requirements) .....	3
<sup>10</sup> Humanities electives (group requirements) .....	11
Physics 20, 21, 22 .....	15
	50

#### JUNIOR YEAR

Course	Credits
Meteorology 120, 130, 134, 180 .....	10
Math 145 .....	3
Civil Engineering 140 .....	3
Mechanical Engineering 116, 160 .....	7
<sup>11</sup> Electives .....	27
	50

#### SENIOR YEAR

Course	Credits
Meteorology 111, 131, 132, 133 .....	12
Applied Statistics 131, 132 .....	8
Mechanical Engineering 117 .....	3
<sup>11</sup> Electives .....	28
	51

<sup>6</sup>To be selected from: Botany 102, 120; Range Science 126, 131; Wildlife Resources 160, 166; Entomology 106.

<sup>7</sup>Electives should include Applied Statistics 51 or 131, 132, 133. If a "Certificate of Competence in Meteorology" is desired in addition to the Bachelor of Science degree, a student must take Civil Engineering 140 and Mechanical Engineering 116, 117, and 160.

<sup>8</sup>Some recommended electives to better train the student for his profession are: Meteorology 126, 134, 141, 145, 170, 171; Computer Science 167; English 111 or 113; Range Science 130, 132; Geography 135.

<sup>9</sup>Students who have not completed trigonometry in high school must also take Math 46.

<sup>10</sup>Humanities electives of special benefit are Speech 1 and 21, Landscape Architecture 3, or a foreign language.

<sup>11</sup>Electives suggested to give a student better professional training: Meteorology 126, 129, 141, 145, 170, 171; Soils 165; Geography 135; Computer Science 167; Statistics 133; Range Science 167; English 111 or 113.

## Graduate Study

**Master of Science Degree.** The department, in cooperation with related departments, offers Master of Science programs in Soil Physics, Soil Chemistry, Soil Fertility, Plant Nutrition, Soil Genesis, Soils and Irrigation, Biometeorology and Climatology. A Master of Science degree in the department is accepted by most other universities as equivalent to a year's work toward a Doctor of Philosophy degree in the subject pursued.

**Doctor of Philosophy Degree.** The department, in cooperation with related departments, offers the Doctor of Philosophy degree in: Soil Physics, Soil Chemistry, Soil Fertility, Plant Nutrition, Soil Genesis, Soils and Irrigation, Biometeorology and Climatology. Detailed information may be ob-

tained from the department or from the Dean of the School of Graduate Studies.

**Acceptance.** Student applications, submitted to the School of Graduate Studies, for advanced study in Soils and Meteorology are reviewed by a departmental committee. The applicant may be accepted without reservation, on probation, as a non-candidate, or rejected.

Students accepted on a probationary basis will not be assigned a research problem, given research credit, be assigned a graduate committee, or considered for an assistantship until such probation has been removed as a result of academic excellence. This probationary status cannot be indefinite and is limited to two quarters. A probationary student who does not maintain "B" grades or better will not be permitted to continue in the department.

**Fellowships and Traineeships.** The department has National Defense Education Act (NDEA) Fellowships and National Science Foundation (NSF) Traineeships that are awarded on the basis of national competition.

**Assistantships and Major Professors.** Acceptance of a student to pursue graduate study does not grant him an assistantship or the right to study under a particular professor. Assistantships are awarded to accepted students by the professors having funds to cover specific research. Funds are not available to provide all students with assistantships. Some students who wish to do graduate work may be accepted if they do not desire financial assistance. Permission to study under a particular professor may be granted by the professor in question after consultation with the student.

**Program Direction.** The graduate student's program is directed by a graduate committee consisting of his major professor and at least two other professors. The student and major professors may indicate a choice of committee members, but the final appointment is made by the Dean of the School of Graduate Studies.

## Soils Courses

**56. Introductory Soils.** A beginning survey course. A brief study of soil formation, classification properties, fertility and management. Suggested prerequisite: Inorganic Chemistry. Three lectures, one lab. (4F, W) **Miller**

**57. Introductory Soils Laboratory.** Offers credit for the laboratory of Soils 56 for students who have had a general soils course without a laboratory. (1F, W) **Miller**

**58. General Soils.** Fundamentals of soils with emphasis on range and forest soil problems. Designed for students in forestry and range management. Suggested prerequisite: Inorganic Chemistry. Four lectures, one lab. (5Sp) **Southard**

**105. Soil Science.** Nature and composition of soils; colloidal behavior, soil reaction, solubility, ionic behavior and nature and properties of the interface. Prerequisites: Soils 56, 58 or approval of the instructor. (3F) **Staff**

**106. Soil Science Laboratory.** Laboratory methods in Soil Science. Prerequisite: Prior or concurrent registration in Soils 105 or approval of instructor. (1F) **Staff**

**107. Irrigated Soils.** Soil salinity, soil-moisture-plant relationships, water supply and quality, irrigation water measurement, soil moisture movement, irrigation methods. Prerequisite: An introductory course in soils or approval of the instructor. (2F) **Jurinak**

**110. Soil Microbiology.** See Bacteriology 110.

**111. Soil Seminar.** Review and discussion of current soil problems and literature. Required of all seniors in the department. (1W) **Staff**

**114. Soil Survey and Conservation.** A study of soil morphology and of soil classification, survey, and conservation. Prerequisite: Soils 56 or 58. Two lectures, three labs. Four lab periods in May will be field trips that may last until 7:30 p.m. (5Sp) **Southard**

**150. Special Problems.** Conferences or laboratory investigations. Subject and credit arranged. **Staff**

**155. Chemical Edaphology.** Plant and soil relations with respect to irrigation water and environment; nutrient availability, absorption, toxicity, fertilizers, plant nutrition and water quality. Prerequisite: Soils 56 or 58. (3W) **Smith**

**156. Chemical Edaphology Laboratory.** Methods of analysis of soils and plants. Prerequisite: Prior or concurrent registration in Soils 155 or approval of the instructor. (1W) **Smith**

**165. Physical Edaphology.** The physical relationships of soil moisture, temperature, penetrability, and aeration to plant growth. Structural conditions, tillage, irrigation, and other soil management practices are considered as factors that affect these relationships. Prerequisite: Previous soils training. (3F) **Hanks**

**166. Physical Edaphology Laboratory.** Methods of analysis of the physical properties of soils. Prerequisite: Prior or concurrent with Soils 165 or approval of the instructor. (1F) **Hanks**

**167. Physical Analysis of Soils.** A laboratory course in Soil Physics. Prerequisite: Soils 166. (2W) **Hanks**

**177. Chemical Analysis of Soils.** A laboratory course in chemical analysis of soils and plants. Emphasis will be on the theory of analytical techniques and the operation of instruments necessary for the more usual analyses done in plant and soil research. Two laboratory periods. Prerequisite: Permission of the instructor. (2W) **Miller**

## Graduate Courses

**212. Seminar.** Review of current literature in soil science. Required of all graduate majors. (1F, W, Sp) **Staff**

**\*214. Soil Physics.** A theoretical discussion of soil as a physical body. The structure of clay minerals and their relation to absorption and other surface phenomena; soil moisture and air relations; and soil stabilization are considered. Prerequisite: Soils 165. (3Sp) **Hanks**

**\*\*215. Physical Chemistry of Soils.** An advanced course involving the physio-chemical, colloidal and surface aspects of soils and related systems. Prerequisite: Chem 106. (3W) **Jurinak**

**218. Special Problems.** Soils students review literature on problems and conduct experiments. Credit arranged. (F, W, Sp, Su) **Staff**

**219. Saline and Alkali Soils.** Survey of literature and technical problems in the development, evaluation, classification, reclamation and management of saline and alkali soils. (2Sp) **Smith**

**\*\*221. Genesis, Morphology and Mineralogy of Soils.** A study of soil formation and alteration; rates of chemical change, age-dating of soils, and unique soil formations. Prerequisite: Soils 114 or permission of the instructor. Three lectures. (3F) **Southard**

**\*224. Soil Chemistry.** Chemical nature of soils; surface chemistry and ionic equilibria, electrokinetic properties; chemical phenomena of individual elements in soils. Prerequisite: Soils 155 or approval of the instructor. (3Sp) **Jurinak**

**230. Research and Thesis.** Outlining and conducting research in soils and preparation of thesis. Credit arranged. (F, W, Sp, Su) **Staff**

## Meteorology Courses

**17. Introduction to Weather and Climate.** A survey course which treats temperature, wind, clouds, precipitation, storms, air masses, atmospheric circulation, and the impact of weather and climate on human activities. (3F, W, Sp) **Ashcroft**

**\*\*27. Descriptive Oceanography.** A survey course designed to give students a broad background on the nature and behavior of the oceans and their coastlines. Emphasis will be on relationships between oceanography and other fields. (3W) **Reynolds**

**111. Meteorology Seminar.** Review and discussion of current meteorology problems and literature. Required of all Seniors majoring in meteorology. (1W) **Staff**

**117. Weather and Climate.** A course primarily designed to give teachers a basic knowledge of weather phenomena, including causes and effects, and to explain topographic and seasonal changes in weather and climate. Aids in teaching weather and climate will also be an important part of the course. Credit will not be given for both Met 17 and Met 117. (4Su) **Richardson**

**\*\*120. Physiographic Climatology of the United States.** The general cause and effect relationships between physiographic features and climates. These principles are then applied to a discussion of climates within the United States, broken down on a regional basis. Prerequisite: Met 17 or instructor's consent. (3Sp) **Reynolds**

**125. Bioclimatology.** Interrelations between living organisms, both plants and animals including man, and the physical and chemical factors of their atmospheric environment. Prerequisite: Met 17. (3W) **Ashcroft**

\*Taught 1968-69

\*\*Taught 1969-70

**126. Environmental Climatology.** Readings in climatic changes resulting from environmental modifications due to engineering construction, architectural design, agricultural practices, and other activities of mankind. Prerequisite: Met 17. Credit arranged. (F, W, Sp, Su) **Staff**

**129. Physical Oceanography.** Readings selected to give the student a fundamental understanding of the physical characteristics of the oceans, particularly from the viewpoint of interrelationships between the oceans and the atmosphere. The readings will cover such things as: physical properties of sea water; observations in physical oceanography; the heat budget of the oceans; the general distribution of salinity, temperature, and density; ocean currents; wind currents and wind waves; water masses; interaction between the atmosphere and the oceans. Prerequisite: Physics Met 17, 27 or instructor's consent. Credit arranged. (F, W, Sp, Su) **Reynolds**

**\*\*130. Observations and Instruments.** Meteorological observations, techniques and equipment. Covers standard meteorological observational techniques, those used for upper atmospheric observations, and those used for special purposes such as micro or biological work. Prerequisite: Met 17. (2W) **Ashcroft**

**\*131. General Physical Meteorology.** Condensation processes in the atmosphere; visibility in meteorology; solar and terrestrial radiation; meteorological acoustics; meteorological optics; atmospheric electricity. Prerequisites: Met 17, Physics 22 or instructor's consent. (3F) **Reynolds**

**\*132. General Dynamic Meteorology.** A brief review of fundamental and physical concepts; definitions of selected hydrodynamic and thermodynamic terms; the thermodynamics and status of the atmosphere; the effects of water vapor on the thermodynamic characteristics of the atmosphere; horizontal motions in the atmosphere; and characteristics of fluid flow. Prerequisites: Met 17, Physics 22 or instructor's consent. (3Sp) **Reynolds**

**\*133. General Synoptic Meteorology.** General circulation patterns, vertical structure, development, and life cycle of cyclones and anticyclones. Air masses and fronts and their structure. Interpretation and analysis of meteorological charts and diagrams including thermodynamic charts, cross sections, and surface and upper air maps. Three lectures, two lab recitations. Prerequisites: Met 17, Physics 22, or instructor's consent. (5W) **Richardson**

**\*\*134. Atmospheric Phenomena.** Treatment of fog, clouds, thunderstorms, tornadoes, lightning, atmospheric electricity, auroras, atmospheric acoustics, atmospheric optics, and hurricanes. Prerequisites: Met 17, Physics 22, or instructor's consent. (2F) **Reynolds**

**141. Tropical Climatology.** Selected readings on expected climatic conditions and the wide variations in these conditions. Relationships between these climates and meteorological patterns, topographical conditions, coastal and continental locations, industry, transportation, vegetation, agriculture, health, and wealth. Prerequisite: Met 17. Credit arranged. (F, W, Sp, Su) **Reynolds**

**145. Paleoclimatology.** Readings in paleoclimatology. A review of factors influencing climatic change and evidences of climatic variations drawn from many disciplines. Prerequisite: Met 17. Credit arranged. (F, W, Sp, Su) **Richardson**

**150. Special Problems.** Conferences or laboratory investigations. Subject and credit arranged. (F, W, Sp, Su) **Staff**

**170. Air Pollution Climatology.** Readings selected to give a broad background of the air pollution problems in the United States and the place of meteorologists in their solutions. Assignments will include topics such as: the extent of air pollution in the United States; meteorological conditions favorable to the concentration of contaminants macro, meso and microscale influences contributing to the development of air pollution; regional discussions of the distribution of air pollution-favorable climates; and meteorological measurement support systems. Prerequisites: Met 17, college Physics and Calculus. Credit arranged. (F, W, Sp, Su) **Reynolds**

**\*171. Cloud and Precipitation Physics.** Brief review of thermodynamics of moist air; thermodynamic equilibrium and change; nucleation processes; nuclei in the atmosphere; the initial growth of droplets and ice crystals in clouds; cloud droplet spectra and growth by coalescence; cloud dynamics; weather modification. Prerequisite: Met 17. (3W) **Reynolds**

**180. Methods in Applied Climatology.** Readings and problems in the procedures and techniques of selecting, organizing, summarizing, interpreting, and reporting climatic information for specific practical purposes. The concentration will be on the entire problem, beginning with its specific definition and ending with the report to the assumed client. A wide spectrum of climatic parameters, including synoptic conditions, will be considered separately and in combination. Prerequisites: Met 120. Credit arranged. (F, W, Sp, Su) **Staff**

**212. Seminar.** Review of current literature in meteorology. Required of all graduate majors. (1F, W, Sp) **Staff**

**218. Special Problems.** Students select a problem, review the literature, conduct exper-

\*Taught 1968-69

\*\*Taught 1969-70



iments, and write a report. Credit arranged. (F, W, Sp, Su) **Staff**

**225. Applied Climatology.** Readings selected to develop the student's knowledge and appreciation of the effects of meteorological conditions and events on industry, agriculture, health, marketing, population distribution, biological processes, and/or other activities according to the student's backgrounds and interests. The potential and limitations of climatological information in decision processes. Prerequisite: Permission of the instructor. Credit arranged. (F, W, Sp, Su) **Staff**

**230. Research and Thesis.** Outlining and conducting research in soils and preparation of thesis. Credit arranged. (F, W, Sp, Su) **Staff**

**\*\*241. Physical Climatology.** Special emphasis will be placed on the global energy and water balance regimes of the earth and its atmosphere. These topics entail a discussion of radiation, heat transfer in soil, water and air, and evapotranspiration. Prerequisites: Met 131, 132. (3W) **Ashcroft**

**242. Mountain Climatology.** Readings in free air climatology as determined from upper air soundings. Modifications of the free air imposed by interaction of principles studied in Physical Climatology and variations in slope, aspect, altitude and other topographic influences. Credit arranged. (F, W, Sp, Su) **Staff**

**\*\*Taught 1969-70**

## Department of

# Veterinary Science

**Head: Professor Merthyr L. Miner**  
Office in Veterinary Science 103

**Professor James L. Shupe; Associate Professors Joseph T. Blake, Jay W. Call, Ross A. Smart, Don W. Thomas; Assistant Professor James A. Thomas; Research Associate Arland Olson; Research Assistants Robert Davis, Everett Fisher, Robert Thornley; Collaborators Wayne Binns, Lynn F. James, Kent Van Kampen.**

**Degree: Bachelor of Science (BS).**

**Major: Veterinary Science.**

The courses offered by the Department help round out the training of students in animal science courses. The advanced courses are for those in graduate studies in Animal Sciences, Biochemistry, Zoology, Bacteriology, Toxicology, and Wildlife.

If one desires to study toward a degree in Veterinary Medicine (DVM), he can apply to one of the 18 schools of Veterinary Medicine in the United States. Enrollment into veterinary schools is limited. Prior to application to a veterinary school, a student must complete the pre-veterinary courses outlined below. Many students complete these basic science courses by obtaining a BS degree in related science curriculum such as animal science, zoology, bacteriology, and chemistry. Such majors

are eligible for entrance into any veterinary school.

The State of Utah has entered into a compact with the Western Interstate Commission for Higher Education whereby Utah will subsidize the training of at least five students in each of the four years, in veterinary schools operating under the compact. This subsidy relieves the student of paying out-of-state fees. He has to pay all other fees that in-state students pay. If a student is a Utah resident and has completed the pre-veterinary requirements, he must apply to the Utah Commission for certification to the three western schools cooperating under the compact. These applications are due December 1 of each year. He must also make independent applications to the schools of his

choice. Entrance into a veterinary school under the compact is dependent on the acceptance of a student by the veterinary school.

## Suggested Pre-Veterinary Courses

FRESHMAN YEAR		
Course		Credits
English 1, 2, 3 .....		9
Math 35, 46, 96 .....		15
Chemistry 20, 21, 22 .....		15
Social Science or Humanities .....		9
MS, AS, or PE .....		3
		51
SOPHOMORE YEAR		
Course		Credits
Physics 17, 18, 19 .....		15
Biology 15 .....		5
Zoology 16 .....		5
Botany 26 .....		5
Animal Science 10 .....		5
Social Science or Humanities .....		10
Electives .....		9
		54
JUNIOR YEAR		
Course		Credits
Chemistry 115, 121, 122, 123 .....		15
Zoology 112, 118 .....		10
Social Science or Humanities .....		6
Electives .....		20
		51

Electives should include subjects recommended by schools of Veterinary Medicine such as: statistics, biochemistry, foreign language, marketing, business.

## Veterinary Science Courses

**20. Anatomy and Physiology of Animals.** A study of how the animal's body is constructed and functions. Each system is studied with emphasis on the digestive and reproductive

systems. This is a basic biology course for any interested student. Four lectures, one lab. (5W) **Blake**

**120. Animal and Poultry Hygiene.** Principles of animal sanitation in relation to disease control. Federal and state disease control programs and the etiology, symptoms, and control measures of the more prevalent diseases are also studied with demonstrations of first aid and the common farm operations on animals. Three lectures, one lab. (4Sp) **Call**

**\*140. Veterinary Parasitology.** Detailed study of the scientific name, common name, class, range, pathogenesis, life cycle, methods of control, and treatment of common internal and external parasites of domestic animals. Four lectures, one lab. (5F) **Miner**

**150. Artificial Insemination of Animals.** A study of the basic concepts of the science of reproduction as related to artificial insemination, training in the art and the management of artificial insemination organizations. The course is for majors in the animal science field who have had courses in anatomy and physiology, bacteriology, nutrition and breeding. One lecture, two labs. (3Sp) **Call**

**200. Special Problems.** Open to upper division or graduate students majoring in subjects related to veterinary medicine and who wish to study a particular phase of disease in animals. (1-3F, W, Sp) **Staff**

**210. Research.** Outlining and conducting research on animal diseases. Any quarter. Credit arranged. **Staff**

**\*\*230. General Pathology.** An introduction to the cause and mechanism of disease processes: degenerative changes, circulatory disturbances, inflammation, regeneration, neoplasms, and nutritional alterations. Prerequisites: Zoology 118 and 128. Three lectures, two labs. (5W) **Shupe**

**\*\*231. Systematic Pathology.** A study of the diseases of the cardiovascular, hemopoietic, respiratory, digestive, urinary, genital, endocrine, nervous, locomotor and tegumentary systems. Prerequisite: VS 230. Three lectures, two labs. (5Sp) **Shupe**

\*Taught 1968-69

\*\*Taught 1969-70



*COLLEGE OF BUSINESS  
AND SOCIAL SCIENCES*

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*College of*

# Business and Social Sciences

Robert P. Collier, **Dean**

William V. Tezak, **Assistant to the Dean**

Office in Main 131

The American economy today provides an unusual opportunity for enterprising managers and businessmen. In a free enterprise economy such as ours, the decisions of the business world are made by individual managers and owners of business. The very course of our national progress and prosperity is determined by the decisions and actions of businessmen. As never before, we need leadership in this area. We are currently challenged by an alternative approach—totalitarian state planning. If our system is to survive and grow, dynamic, imaginative leadership is needed in the business world, and great rewards await those who can provide this leadership.

Throughout all history man has been faced with certain crucial social problems which have never been solved: crime, poverty, tyranny, prejudice, war, injustice—the list is legion. The Social Sciences take as their special province the study of individual and group relationships and behavior, and thus attempt to explain, understand, and provide solutions to these great problems. Political Science explores the methods of government, or group law and order, vitally necessary for the preservation of our democracy and personal liberties. Economics analyzes the production and utilization of goods and services and the allocation of our scarce resources which set a ceaseless limitation on our abilities to fulfill man's aspirations. History studies the full sweep of man's experience with the hope that we can

learn from our forefathers' experiences and rise upward to new heights of human existence. Sociology deals with the group relationships within the family, subcultures, work environment, and other groups. Anthropology studies diverse cultures such as the American Indian. Special attention is given to social work, crime, population problems, women's role in society, and other great sociologic problems which beset us. Many of mankind's greatest problems lie in the field of the Social Sciences. The challenge, as well as the opportunity, for significant breakthroughs has never been greater.

**The purpose of the College of Business and Social Sciences** is to provide an education that is practical and realistic, preparing men and women to take an active part in the main stream of our society so that our progress and prosperity will grow in the years ahead. At least a minimal introduction to social science is required of all students in the University.

## Financial Aid

Many significant scholarships are available to students majoring in Banking and Finance, Economics, Social Relationships, Accounting and other areas in the College. The top ten per cent of the graduating class is awarded membership in the honorary scholastic fraternity of Phi Kappa Phi. Internships are also available in accounting and political science.



**Career Opportunities.** Courses in the College of Business and Social Sciences provide the foundation upon which to build significant careers in such occupations as the following: business executive, accountant or CPA, social worker, secretary, lawyer, salesman or marketing expert, personnel manager, historian, high school teacher, banker, economist, politician, or government worker, foreign service, juvenile court worker, criminologist, anthropologist, geographer, econometrician, office manager, investment broker, operations analyst, welfare worker, production man-

ager, investment counselor, college professor, public administrator.

## Majors

The seven departments in the College offer the following majors: Accounting, Finance, Marketing, Personnel and Industrial Relations, Production Management, Business Education, Distributive Education, Office Administration, a combination major in Office Administration and Family Life, History, Political Science, Pre-Law, Sociology, Social Work.

## Department of

# Accounting

**Head:** Professor Norman S. Cannon  
Office in Main 131

**Assistant Professors** Duane Barker, W. Glenn Cannon,<sup>1</sup> Joseph S. Merrill, Ronald L. Pierce, William V. Tezak.

**Degrees:** Bachelor of Arts (BA), Bachelor of Science (BS), Master of Science (MS).

**Major:** Accounting.

The basic objective of the first two years' program in the Department of Accounting is to provide a broad and sound educational foundation upon which to build a professional education in Accounting.

well as the state and institutional requirement for an understanding of the American system. The few courses in Business and Economics offered in the Sophomore year form the foundation for entry into the upper division professional program.

## Undergraduate Study

### Lower Division

The proposed program for the first two years stresses general education in the Social Sciences, the Natural Sciences, and the Humanities. It fills the lower division group requirements as

### FRESHMAN YEAR

Course	Credits
English 1, 2, 3 .....	9
Natural Science (Math, Physiology, Biology, Physics, Chemistry, Geology, etc. Math 35 and 66 are required) .....	18
Political Science 10 .....	5
History, Sociology 70 or Psychology 53 .....	10
PE, MS, or AS .....	3-6
Approved Electives .....	0-5

<sup>1</sup>On leave 1968-1969

**SOPHOMORE YEAR**

Accounting 1, 2, 3 Introductory	
Accounting .....	9
Office Administration 92 .....	2
Economics 51, 52 .....	10
Computer Science 11 .....	3
Math 60-66 .....	8
Humanities .....	10-15
Approved Electives .....	5-11

**Upper Division**

During the last two years all accounting majors must take the following core and supporting courses:

**Business Administration**

- BA 104, 105, 106 Commercial Law, Junior Year
- BA 131, 132 Business Statistics, Junior year
- BA 133 Management Concepts, Junior year
- BA 151 Marketing, Junior year
- BA 180 Financial Institutions

**Economics**

- Econ 107 Intermediate Economic Theory
- Econ 165, or 108, or 171

**Accounting**

- Acct 101, 102, Intermediate Accounting
- Acct 103, 104 Advanced Accounting
- Acct 111 Cost Accounting, Junior year
- Acct 121 Auditing, Senior year
- Acct 127 Income Tax Accounting, Senior year
- Acct 140 Accounting Theory

**Computer Science**

- CS 157, or 158 Programming Business Problems

**Professional Electives.** In addition, the student must take at least 15 credits of electives selected from the following:

**Business Administration**

- BA 105, 106 Business Law
- BA 119 Accounting Systems and Automation
- BA 134 Production Management
- BA 149 Business Policy
- BA 171 Personnel Administration
- BA 181 Corporation Finance
- BA 182 Problems in Finance
- BA 185 Investments

**Accounting**

- Acct 112 Standard Costing
- Acct 128 2nd Quarter of Income Tax Accounting
- Acct 129 Governmental Accounting
- Acct 150 Managerial Accounting
- Acct 206, 207, 208 CPA Review

**Approved Courses.** A student may not have time to take all of

the courses of a professional interest to him in his four-year degree program. Several Professional Accounting organizations have gone on record as favoring a fifth year in which to cover this additional area. Students with good scholastic records would be well advised to seek the Master of Science degree in this fifth year.

**Selection of a Minor.** A student majoring in Accounting may select a minor in any area as long as his program meets the University requirements and is approved by the minor department and his major adviser. In the past the most usual minor for Accounting majors has been Economics. If a student wishes to minor in Business Administration, he will be required to take BA 134, 149, and 171 in addition to the core courses in business.

**Graduate Study**

The Accounting Department offers a graduate program leading to the Master of Science degree in Accounting.

Financial assistance is available in the form of graduate assistantships for outstanding candidates. Graduate assistants lead introductory sections of the basic courses or otherwise assist individual faculty members. USU also offers a number of fellowships which are open to all majors including Accounting students.

The graduate program in Accounting permits a higher degree of specialization in Accounting than is allowed in the MBA program yet maintains close liaison with that program. Approximately 30 per cent of the course work for the graduate degree will be in MBA oriented courses.

For details of requirements see the graduate catalog.

**Accounting Courses**

**1, 2, 3. Introductory Accounting.** Accounting concepts and techniques essential to an understanding of the operation of the business enterprise. Open to all students of Sophomore standing or above. Business majors should take this course in their Sophomore year.

(3F, 3W, 3Sp, 3Su)

**Staff**

**100. Survey of Accounting Principles.** For Engineering, Agriculture, Family Life, Forestry, Education, and other non-business students. (4F, W, Sp, Su)

**Tezak**

**101, 102. Intermediate Accounting Principles.** Modern analytical and interpretive aspects of accounting. Prerequisites: Accounting 1, 2, and 3. 101 (4F, 4W) 102 (4W, 4Sp) **Barker, Pierce**

**103, 104. Advanced Accounting.** The study of special accounting problems. 103 (4F, 4Sp) 104 (4F, 4Sp) **Cannon, Merrill**

**111. Industrial Cost Accounting.** Job costing, process accounting, and special considerations. (5W, Sp, Su) **N. Cannon**

**112. Advanced Cost Accounting.** Standard costing, direct costing and advanced theory in Cost Accounting. (3Sp) **N. Cannon**

**119. Accounting Systems and Automation.** The application of new methods of processing data to the various types of accounting records and accounting systems. (3W) **Staff**

**121. Auditing Theory and Practice.** Principles and procedures associated with accounting verification and audit practice. Prerequisite: A year of Intermediate Accounting. (4W) **Merrill**

**127, 128. Income Tax Accounting.** A study of problems resulting from the imposition of taxes on income by the Federal Government, with emphasis on the accounting phases of these problems. 127 (4F, 4Sp), 128 (4W) **N. Cannon**

**129. Government Accounting.** Basic principles underlying treatment of public and governmental accounts. Typical topics for study are: statutory funds, budgets, trust funds, and preparation of financial reports. (3W) **Barker**

**140. Accounting Theory.** History and development of accounting and financial statements. Their meaning and interpretation with special emphasis on current problems in Accounting Theory. Prerequisite: A year of Intermediate Accounting. (4F, 4W) **Merrill**

**199. Internship in Accounting.** Practical experience with public accounting firms and approved business in the Intermountain and Pacific Coast Regions for selected Seniors. Credit arranged, not to exceed 7 hours. (F, W, Sp, Su) **N. Cannon**

**206. CPA Law Review.** Review of the elements of business law. (3F) **Daines**

**207, 208. CPA Review.** Courses aimed at guiding the student to the successful completion of the Certified Public Accountant examination. The staff will maintain advisory contact with students until this goal is reached. (3W, 3Sp) **N. Cannon**

**209, 210. Accounting for Management Control.** An introduction to accounting at the graduate level. Emphasis is on the use of accounting information in making business decisions. (3F, W) **Merrill**

**212. Cases in Cost Accounting.** Cost accounting application to management decision making. Prerequisite: Acct 111 (3F) **N. Cannon**

**221. Seminar in Auditing** (3Sp) **Merrill**

**241. Seminar in Controllershship.** Investigation of the function of the controller in a modern business organization. Prerequisites: Intermediate Accounting and graduate status or permission of the instructor. (3F) **Merrill**

**290. Thesis.** For students preparing a Master's degree thesis. Credit arranged. (F, W, Sp, Su) **Staff**

**295. Independent Research and Reading.** Credit arranged. (F, W, Sp, Su) **Staff**

**297. Accounting Seminar.** Seminar in accounting theory. Will require completion of one Plan B Project. BA 230 is recommended as a foundation but not required. (3W) **Merrill**

**298. Accounting Seminar.** Seminar in accounting problems. Emphasis on special problems such as price-level accounting, leases, pension plans, statistical sampling, etc. Plan B Project required. (3Sp) **N. Cannon**

## Department of

# Business Administration

**Head:** Associate Professor Howard M. Carlisle  
Office in Main 131

**Professor** L. Mark Neuberger; **Associate Professors** Eugene C. Kartchner, Calvin D. Lowe, Glenn F. Marston; **Assistant Professors** John R. Cragun, David R. Daines, Kenneth Fan, Allen D. Kartchner, Mark J. Nelson, Krishna Shetty, Ted D. Stoddard, Lawrence C. Taylor.

**Degrees:** Bachelor of Arts (BA), Bachelor of Science (BS), Master of Business Administration (MBA).

**Majors:** Finance, Marketing, Personnel and Industrial Relations, Production Management.

The purpose of the Business Administration program is to prepare men and women for administrative positions in business, government and other institutions. Specialized training is provided within specific functional fields of 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 four areas:

1) Finance leading to careers in banking, brokerage activities and investments, and positions as financial analysts in industrial corporations.

2) Marketing involving positions in sales, advertising, retailing, traffic and transportation, and other similar activities.

3) Personnel and industrial relations related to the personnel functions of recruitment, wage and salary administration, training, collective bargaining, and labor relations.

4) Production management where one might become employed 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.

## Placement Services

Each year over a hundred organizations from business, government and education contact the University to interview applicants for a wide variety of positions.

## The Management Institute

In response to the educational needs of business and industry, the Management Institute of the College of Business and Social Sciences offers a variety of seminars, workshops, and conferences throughout the year. These are all non-credit offerings and cover such materials as the management of small business, executive development, decision making, human relations in administration, middle-management concepts, etc.

For further information about the services provided through the Management Institute, contact Director Calvin D. Lowe.

## Undergraduate Study

### Lower Division

The basic objective of the Lower division program in the Department of Business Adminis-

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tration is to provide a broad and sound educational foundation upon which to build a specialized education relating to business.

The following program is required for Business majors during the first two years:

FRESHMAN YEAR	
Course	Credits
English 1, 2, 3 .....	9
Natural Science (18 credits required) .....	
Math 35 and 60 .....	8
Biological Science .....	5
Physical Science .....	5
Phy. Ed., MS, or AS .....	3
Political Science 1 or 10 .....	5
Sociology 70 and Psychology 53 .....	10
Computer Science 11 .....	3
Total .....	48

SOPHOMORE YEAR	
Course	Credits
Acct. 1, 2, 3 Introductory Accounting .....	9
BA 4, 5, 6 (or 104, 105, 106) Business Law .....	6
Economics 51, 52 .....	10
Humanities .....	10
Math 66, Mathematical Analysis .....	5
Electives .....	8
Total .....	48

This program for the first two years includes few business courses and stresses general education in the Social Sciences, the Natural Sciences, and the Humanities. It fills the lower division group requirements, established by the University.

### Upper Division

The objective of the upper division program is to provide sufficient specialized business training to prepare the student to successfully enter the business world in his chosen functional field. The program is also directed at providing the type of general business education that develops the attitudes and analytical ability required for future professional advancement.

During the Junior year the objective is to provide the student a broad background within business

by requiring that courses be taken in all of the key functional areas. The required core courses are as follows:

Course	Credits
BA 131, 132 Business Statistics .....	6
BA 133, Management Concepts .....	3
BA 134, Production .....	5
BA 143, Business Communications .....	3
BA 150, Managerial Accounting .....	5
BA 151, Marketing Principles .....	5
BA 171, Personnel Administration .....	5
BA 180, Financial Institutions .....	3
Econ 107, Micro-economic Theory .....	4
Econ 108, Macro-economic Theory .....	4
Total .....	43

One additional core course is required. This is BA 149, Business Policy. However, this is a capstone course and should not be taken until the Senior year.

The Senior year is devoted to obtaining specialization within one of four functional fields of business training.

### Finance Major

Finance emphasizes analytically the supply of, demand for, and management of money in business and investment institutions. Students majoring in this field must take the following courses in addition to the basic core. Junior year: Economics 107, 165, and 171. Senior year: BA 182, BA 183, Economics 139 and 155. Additional work in Math and Computer Science is highly useful for Finance majors.

### Marketing Major

Modern marketing consists of a total system of interesting business activities designed to plan, price, promote, and distribute want-satisfying goods and services to society. The entire system of business action is becoming more and more market- or consumer-oriented, thereby greatly increasing the demand for graduates with training in marketing. The



following courses are designed to prepare students for careers in all areas of marketing and must be taken in addition to the basic core Junior year: BA 152 and 153. Senior year: BA 156 or 160 or 161 and Economics 165 or BA 181.

### Personnel and Industrial Relations Major

All business operations depend upon manpower; its effective coordination is essential to the success of the enterprise. If students are particularly interested in the recruiting, testing, training, motivation, and human relations aspects of management, they should take the following courses in addition to the basic core: Junior year: Economics 123, 125, 126, Psychology 155. Senior year: BA 174, 175, 178 and Sociology 158 or 159 is recommended.

### Production Management Major

The production activity gives shape to a firm's physical products; production management involves the planning, directing, and controlling of activities related to production. Typical starting jobs for graduates are in procurement and materials control, production planning and control, quality control, cost control, and first line supervision. In addition to the basic core, required courses are: Junior year: Manufacturing Engineering 56, 148, Computer Science 157. Senior year: BA 136, 138, Manufacturing Engineering 137, Economics 125, Computer Science, Mathematics, and technology courses are recommended electives.

### Business Administration Major with Computer Science Minor

With the rapid acceptance of electronic data processing by the business world, a strong minor in

Computer Science is a valuable adjunct to the training of most Business Administration majors. The following courses constitute a minor in Computer Science:

	Credits
Philosophy 50 (Beginning Logic) .....	5
CS 11 (Data Processing) .....	3
CS 157 (Programming Business Problems) .....	3
CS 198 (Special Problems) .....	3
Other Computer Science .....	3

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Dr. Rex Hurst, in the Computer Center, can recommend additional courses for students desiring further work in Computer Science.

### Business Administration Minor

A solid minor in Business can be extremely valuable when linked to a major in Agriculture, Landscape Architecture, Forestry, Science, Home Economics, etc. Any student who expects to operate his own technical business or professional office should strongly consider a Business minor. The following courses constitute a minor in Business Administration:

	Credits
Acct 100 Survey of Accounting Principles....	4
BA 133 Management Concepts .....	3
BA 151 Marketing Principles .....	5
BA 171 Personnel Administration .....	5
BA 180 Financial Institutions .....	3

In special situations, students will benefit from a minor more specialized than the one specified above. Such minors are accepted subject to the approval of the Head of the Department of Business Administration. A general guideline is that 15 credits must come from the core courses, with an additional five credits representing courses outside the established core.

### Graduation Requirement

To be recommended by the department for graduation, all Business Administration majors must

have obtained a grade point average of at least 2.1 in both their BA courses and the courses in their minor field.

### Graduate Study

The Department of Business Administration offers a graduate Master of Business Administration degree. This popular degree is designed to give the student special training of a general management nature aimed at providing a background for advancement into supervisory positions in business organizations. The MBA degree does not emphasize narrow specialization in one of the functional fields of business; rather it is a general management degree aimed at developing potential business leadership. Training in the behavioral aspects of administration and in the newer quantitative tools is emphasized. The program provides small classes, intimate contact with professors, significant individual flexibility, and an emphasis on individual development.

The MBA degree is open to qualified students with a Bachelor's degree regardless of their undergraduate major. Students with undergraduate majors in Engineering, Mathematics, Sociology, and Psychology are particularly welcome. Students with undergraduate majors in Business and Economics typically require 45 credits or three quarters to complete the program. Students with undergraduate degrees other than in business or economics may require up to 90 credits (6 quarters) to complete their program depending on their undergraduate preparation. The last 45 credits of the program consists entirely of graduate courses. The student must either complete a thesis for 10 credits or complete BA 230, 231, and 232 involving business research methods and reports. Details regarding the

course work and requirements are found in the graduate catalog. Financial aid is available in the form of graduate assistantships for qualified students.

### Business Administration Courses

**4, 5, 6. Business Law.** BA 4 is a general survey. It is also introductory for students who take additional Commercial Law courses. BA 5 and 6 are devoted to a comprehensive study of the law of contracts and agency. Open to all students of Sophomore standing or above. (2F, 2W, 2Sp) **Benson, Daines**

**20. Introduction to Business.** An investigation of the role of business in contemporary society, including an introduction to the general problems of business operation. (3F, W, Sp) **Staff**

**\*\*30. Business Mathematics.** A remedial course in beginning mathematics.

**63. Salesmanship.** The history, development, and opportunity of sales work. Focuses on the principles of the selling process—interviews, presentation, holding attention, arousing desire, meeting objections, and creating acceptance. Special selling projects are conducted. Lecture and cases. (2F, Sp) **Lowe**

**104. Business Law.** Introduction to law and the law of contracts and agency. Not open to students who have had BA 4, 5, or 6. (3F) **Daines**

**105. Business Law.** The law of commercial paper, property, bailments and sales. Not open to students who have had BA 4, 5, or 6. (3W) **Daines**

**106. Business Law.** The law of partnerships, corporations, bankruptcy and suretyships. Not open to students who have had BA 4, 5, or 6. (3Sp) **Daines**

**113. Business Simulation.** Principles of Model Building and a simulation of actual business problems as practice in decision making. (2Sp) **Staff**

**117. Introduction to Stored Programming.** Basic computer logic, flow charting, routines, coding, library programs, and data processing application to business. (3Sp) **Kartchner**

**118. Procedure Development.** Principles of job planning and procedure development as applied to the electric accounting machine method of keeping records and processing statistical data. (3W) **Kartchner**

**\*\*Taught 1969-70**

**119. Accounting Systems and Automation.** The application of new methods of processing data to the various types of accounting records and accounting systems. (3F)

**Kartchner**

**131. Business Statistics.** Probability, statistical inferences, statistical descriptions, frequency distributions, simple linear regression and correlation, and analysis of variance and co-variance. Prerequisites: Math 35, 60, 66. (3F, W, Su)

**Kartchner**

**132. Business Statistics.** Time series analysis, multiple regression, sampling, statistical quality control. Prerequisite: BA 131. (3W, Sp, Su)

**Kartchner**

**133. Management Concepts.** The investigation and application of fundamental concepts of management and organization theory. Prerequisite: Junior standing or above. Business majors should take this course Fall or Winter term of the Junior year. (3F, W, Sp, Su)

**Carlisle, Shetty, Taylor**

**134. Production.** A study of the production function and its problems, considering interrelationships with other business activities. Focuses on the managerial aspects of: production planning, procurement, inventory control, production control, quality control, layout, methods improvement, performance standards, and basic industrial processes. Prerequisites: BA 131, 133, Math 35, 60, 66. (5W, Sp, Su)

**Kartchner**

**136. Procurement and Production Control.** A study of the planning and direct control of materials and production activities. Broad topics covered include: industrial purchasing, the planning and control of inventories, and the planning and control of production. Prerequisites: BA 133, 134, Manufacturing Engineering 56, 148, or equivalent. (5F) **Staff**

**\*\*137. Production Management II.** **Staff**

**138. Quantitative Methods For Production Management.** A study of the application of quantitative techniques for analysis to selected production problems. Topics covered include: the use of graphic and schematic models, PERT, statistical process control, sampling inspection, and an introduction to the use of linear programming. Prerequisites: BA 132, Manufacturing Engineering 148, or equivalent. (4Sp)

**Kartchner**

**140. 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; life insurance as an investment; and the organization, management, and government supervision of insurance companies. (3F, Sp) **Daines**

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

**142. Advanced Problems in Real Estate.** Advanced course in financial and management problems regarding the use and development of real property. (3Sp) **Lowe**

**143. Business Communications.** The development of psychologically sound and effective business writing. All outside assignments must be in typewritten form. Prerequisites: English 1, 2, 3. (3F, W, Sp, Su) **Stoddard**

**147. Managing Small Business.** Application of management principles and techniques to the independent, owner-manager type of firm. Prerequisite: Junior standing or above. (4F, Sp) **Staff**

**149. Business Policy.** A coordinating course to develop perspective, judgment, and facility in solving problems in production, distribution, personnel, finance, control, and social aspects of business. Prerequisites: BA 132, 133, 150, 151, 171, 181. (5W, Sp, Su) **Carlisle, Shetty**

**150. Managerial Accounting.** Emphasizes the use of accounting as a tool of control for management. Major aspects include budget and managerial control, break-even analysis, selection of alternatives. Prerequisites: Acct. 1, 2, 3, BA 132 or 133. (5F, W, Sp) **Staff**

**151. Marketing Principles.** Describes, analyzes, and evaluates our present marketing system. Provides basic tools and background for understanding marketing principles. Prerequisite: Junior standing or above. (5F, W, Sp, Su) **McDermott**

**152. Marketing Problems and Cases.** Devoted to the analysis of marketing case problems. Prerequisite: Marketing 151 or permission of the instructor. (5W, Sp) **James**

**153. Marketing Readings and Research.** Provides perspective by studying the changing market environment and outlook as conditioners of our material welfare. Prerequisite: Marketing 151. (5Sp) **James**

**\*\*154. Purchasing.** **Staff**

**155. Management of International Operations.** Emphasis on international financial and marketing problems. Deals with U.S. Business planning to operate abroad. Specifically covers areas of exchange rates, tariffs, European Common Market, marketing products in underdeveloped economies. Prerequisites: BA 133, 151, 181. (5F) **Shetty**

**156. Principles of Advertising.** Intended for those who as business executives may direct advertising programs. Includes study of the structure of advertisements for different products, choice of media, consumer research, and the work of advertising departments and agencies. Prerequisite: BA 151. (5F) **McDermott**

**\*\*Taught 1969-70**

**160. Sales Management.** A broad view of important phases of sales administration, planning, and execution applied to manufacturing and wholesale concerns. Deals specifically with the structure and functioning of sales organization and correlation of its activities with those of production and other departments of the business enterprise. Prerequisite: BA 151. (3W, Sp) **McDermott**

**161. Principles and Problems in Retailing.** The marketing process from the viewpoint of the retail distributor: types of retail institutions, accounting and statistics, location, store layout, merchandise classification, service policies, pricing, brand policies, buying, merchandise control, advertising and sales promotion, general organization and administration policies. Prerequisite: BA 151. (5W) **Lowe**

**171. Personnel Administration.** Critical analysis of problems of human relations that confront the manager of a business enterprise and of policies and methods of dealing effectively with these problems. Lectures, problems, and selected cases. Prerequisite: Junior standing or above. (5F, W, Sp, Su) **Cragun, Marston, Shetty**

**174. Employment Practices.** Application of personnel management techniques to the industrial problem related to recruitment, selection and placement of employees. (3F) **Marston**

**175. Wage and Salary Administration.** Analysis of compensation policies and programs, job evaluation programs, job pricing, wage and salary surveys, administration and other related problems. (3W) **Marston**

**178. Problem Personnel and Industrial Relations.** Application of principles of personnel administration to specific personnel and industrial relations problems commonly found in industry. Case studies and problems are emphasized. (A terminal course for personnel and industrial relations majors and minors.) (3Sp) **Marston**

**180. Financial Institutions.** The functions and economic significance of the major financial institutions in the American economy. A review of the role played by these institutions in supplying loanable funds to consumers, business, and governments. Special emphasis on the role of commercial banks as the major supplier of short-term credit in the economy. Prerequisites: Econ 51, 52; Acct. 1, 2, 3; Math 60. (3F, W, Sp) **Nelson, Taylor**

**181. Corporation Finance.** How the corporation raises and manages its capital. A study of modern financial principles, methods, policies, and institutions. Corporate organization, creation, and reorganization. Prerequisite: BA 180. (5F, W, Sp) **Nelson**

**182. Problems in Finance.** The application of basic principles of finance to specific cases

and problems of a typical nature. Prerequisites: BA 181, Economics 15. (3W) **Nelson**

**\*\*184. Credit Administration.** Nature and functions of credit, forms of credit investments, sources of credit information, organization and management of credit operating functions, technical and legal aspects of collections, credit and collection control. (3F) **Staff**

**185. Investments.** Common stock and bond valuation theories. Investment portfolio practices. Analysis of security types as investment alternatives for individuals and institutions. Prerequisites: Econ 51, 52; BA 80. (3F, W) **Nelson**

**186. Security Analysis.** Special methods used in analysis of industrial, public utility, railroad and other securities. Taxation of investment income and its relation to investment policy. Development of principles for timing and selection of securities for investment portfolios. Prerequisite: BA 185. (3W, Sp) **Nelson**

**204. Survey of Business Law.** A detailed investigation of the law and business, especially the application of State and Federal laws to free enterprise and business operations. The law involved in business transactions especially as it applies to property used in business. The legal basis for the conduct of modern economic activity. (3F) **Daines**

**212. Administrative Control.** Management techniques in administrative control through the use of budgetary and accounting data. Emphasizes interpretation of accounting data for managerial purposes. (3F) **Taylor**

**218. Computer and Systems Management.** A study of the computer as a management control system and its role in modern society. Investigation of systems analysis and design as they relate to management activities. (3F) **Taylor**

**230. Business Research Methods.** Methods and techniques of collecting, analyzing, and interpreting business data. (3F) **Kartchner**

**231. Business Problems I.** Each student is to undertake independently a business study culminating in one major business report. Seminar analysis of topics, contents and research methods used. Prerequisite: BA 230, Business Research Methods. Open only to non-thesis MBA students. Meets requirements of one Plan B Report. (3W, Sp, Su) **Staff**

**232. Business Problems II.** Each student is to undertake independently a business study culminating in one major business report. Seminar analysis of topics, contents, and research methods used. Prerequisites: BA 230 and 231. Open only to non-thesis MBA students. Meets requirements for one Plan B Report. (3Sp, Su) **Staff**

**\*\*Taught 1969-70**



**235. Quantitative Methods in Business.** Study and analysis of various statistical models and their application to the decision-making function of the modern business administrator. Deals with quantitative methods for decision making under conditions of certainty, risk, and uncertainty. (3W) **Kartchner**

**240. Free Enterprise and Public Policy.** The problems involved in doing business with the Government. Public policies with regard to: government procurement, research and development, production, personnel practices, contracting, renegotiation, contract termination, ownership of facilities, marketing and pricing, etc. (3W) **Carlisle**

**249. Advanced Business Policy.** Analysis of problems from a managerial point of view, considering all functions and policy areas. Integrates subject matter of marketing, production, finance, accounting, personnel and other associated areas in case problems typically faced by management. (3Sp) **Carlisle**

**250. Managerial Economics.** The integration of economic theory with business practice and policies for the purpose of facilitating decision making and forward planning. (3F) **Durtschi**

**251. Advanced Marketing Problems.** An advanced case approach to current marketing management problems. Emphasis on concepts, research, techniques, decision making, and marketing strategy development. (3W) **McDermott**

**271. Human Aspects of Administration.** An investigation of problems related to the proper use of human resources in business and indus-

try, and their effects on administrative policies and decisions. (3Sp) **Cragun**

**281. Advanced Finance Problems.** An analytic treatment in depth in selected areas of financial management designed to further the student's understanding of the financial management function and the importance it has to the firm. (3W) **Nelson**

**290. Thesis.** For students preparing a Master's degree thesis. Credit arranged. (F, W, Sp, Su) **Staff**

**291. Seminar in Management Theory.** This seminar is directed at reviewing and evaluating the recent theories of management and organization. Traditional theories are analyzed in terms of the impact of the behavioral and mathematical sciences. (3F) **Carlisle**

**292. Seminar in Labor Relations.** Seminar in the theory of the labor movement and the role of labor in today's industrial society. (3W) **Marston**

**293. Seminar in Social Responsibility.** An analysis of social responsibility concepts and an analytic discussion of the issues in social responsibility confronting businessmen in their relations with employees, their customers, and the public and government. (3Sp) **Daines**

**294. Organizational Behavior.** A graduate seminar to study the behavioral philosophies and theories basic to an understanding of human behavior in organizations. (3F, Su) **Cragun**

**295. Independent Research and Reading.** Credit arranged. (F, W, Sp, Su) **Staff**





Department of

## Business Education and Office Administration

**Head:** Assistant Professor Theodore W. Ivarie  
Office in Main 347

**Associate Professors** Dona Fay Frost, Robert J. Motley, Donald A. Neller-moe, Floris S. Olsen; **Assistant Professors** Garth A. Hanson, Helen Lundstrom, Gary R. Smith, Ted D. Stoddard, Jerry L. Wood.

**Degrees:** Bachelor of Arts (BA), Bachelor of Science (BS), Master of Science (MS).

**Majors:** Business Education, Distributive Education, Office Administration, Combination of Office Administration and Family Life, Composite in Business Education, Distributive Education, and Fashion Merchandising and Distributive Education.

The Department of Business Education and Office Administration offers three curricula which provide students with an opportunity to pursue a degree that either prepares them to teach or to work in top-level office positions. The Business Education curriculum and Distributive Education curriculum give broad backgrounds in the major field of business. In addition, students will take all necessary courses leading to a teaching certificate as established by the Utah State Board of Education. Students must complete the last 45 credits of course work leading to the Bachelor's degree in residence at Utah State University. These students should complete an "application for admission to teacher education" 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.

In Office Administration, students will have an opportunity to take all the courses needed to prepare them in the secretarial

field as well as to pursue a minor field of their own choice. This program can lead to a highly respected, top-level office position. A non-stenographic Office Administration major can be developed for those desiring careers as office managers.

### Undergraduate Study Business Education Major

The College of Business and Social Sciences and the College of Education cooperate in the preparation of students for a professional career in Business Education. Both undergraduate and graduate programs in Business Education are available for students preparing to teach, as well as for experienced teachers of business subjects.

The following is a list of requirements for students preparing to enter the Business Education profession. The program of studies for transfer students will be adjusted to meet the minimum professional certification requirements and allow for acceptance of transfer credit.

**Composite Major BE, OA, BA**  
**Minor (if desired) minimum 25 hours**

OA 42	Intermediate Typewriting .....	2
OA 43	Advanced Typewriting .....	2
OA 65	Records Administration .....	3
OA 92	Business Machines .....	2
OA 167	Office Practice .....	2
OA 175	Office Management .....	3
OA 186	Secretarial Procedures .....	3
CS 157	Programming Business Problems..	3
BA 4	Business Law .....	2
BA 5	Business Law .....	2
BA 6	Business Law .....	2
Acct 1	Introductory Accounting .....	3
Acct 2	Introductory Accounting .....	3
BA 143	Business Communications .....	3
BA 151	Marketing Principles .....	5
BA 171	Personnel Administration .....	5
CS 11	Introduction to Computer Science	3
Econ 51	General Economics .....	5
Econ 52	Economic Problems .....	5
BE 178	Methods of Teaching Business— non-skilled .....	3
BE 179	Methods of Teaching Typewrit- ing and Office Practice .....	3
BE 185	Managing Personal Finances .....	5
BE 189	Principles of Business Education..	3

Business Education majors planning to prepare for teaching shorthand and related subjects are required to complete the following courses in addition to those listed above:

OA 141	Dictation and Transcription I ....	5
OA 142	Dictation and Transcription II ....	5
BE 155	Methods of Teaching DE and Cooperative BE .....	3
BE 180	Methods of Teaching Shorthand and Transcription .....	3

The following courses are strongly recommended, although not required, for Business Education majors:

Acct 3	Introductory Accounting .....	3
Acct 127	Income Tax Accounting .....	4
BA 133	Management Concepts .....	3
BA 140	Insurance .....	3
BA 141	Real Estate .....	3
Econ 127	Social Security .....	3
OA 85	Office Data Systems .....	3
Speech 21	Intermediate Public Speaking .....	3

In addition, the following courses must be completed to qualify for secondary school certification in the state of Utah:

<sup>1</sup> Psy 53	Elementary General Psychology	5
Psy 100	Human Growth and Development	3
Psy 106	Educational Psychology .....	3
PH 155	Public Health .....	3
Ed 126	Principles of Secondary Educa- tion .....	3
Ed 127	Student Teaching Seminar .....	3
<sup>2</sup> Ed 129	Student Teaching .....	6
<sup>2</sup> Ed 130	Student Teaching .....	6
Ed 150	Organization and Administration	3

Students who have taken business skill courses such as typewriting and shorthand in high school may not receive credit for beginning shorthand (OA 75) or beginning typewriting (OA 41) in college. Shorthand students will be placed in the appropriate level course by means of an evaluation of their proficiency. Students who have had typewriting in high school should register for OA 42, Intermediate Typewriting, where they may progress according to their individual ability. Any courses that are bypassed may be replaced by elective courses.

Business Education methods courses should be taken in the Junior year if student teaching is to be taken in the Fall or Winter Quarter of the Senior year. BE 189, Principles of Business Education, should be taken in the Sophomore year as a prerequisite to the methods course.

Students may count BE 179 and either BE 155, BE 178 or BE 180 toward the 33-credit professional certification requirement if needed.

## Graduate Study

The Department of Business Education offers courses leading to Master of Science degrees in Business Education and Marketing Education and provides a minor for the Doctor of Education degree. The program established lends itself to a desirable working

<sup>1</sup>Prerequisite to Psy 100 and Psy 106.

<sup>2</sup>Special methods classes must be completed prior to student teaching.

relationship with major professors and allows sufficient flexibility in the program to provide the necessary emphasis needed for individual research and development. Financial assistance is available to outstanding students in the form of graduate assistantships. See catalog, School of Graduate Studies, for further information.

## Business Education Courses

**150. Philosophy of Distributive Education.** Philosophy of vocational business education with special emphasis on the importance of distributive education in a free enterprise system. (3F) **Smith**

**155. Methods of Teaching DE and Cooperative BE.** Instructional methods and coordination techniques involved in teaching cooperative business and distributive education. Includes instructional materials, individual instruction kits, finding and maintaining training stations, selection of students, desirability of advisory committees and student club activities. Prerequisite: BE 150 or instructor's permission. (3W) **Smith**

**178. Methods of Teaching Business — non-skilled.** A study of the methods of teaching as applied to basic courses: General Business, Business Law, Business Principles, Business Arithmetic, Economic Geography, etc. Also, a study of methods applicable to record-keeping and bookkeeping. This course is designed for the inexperienced business teacher education student. (3W, Sp) **Motley, Wood**

**179. Methods of Teaching Typewriting and Office Practice.** Instructional methods and new developments in teaching of typewriting. Methods for building accuracy, speed, and increasing production; work standards; classroom equipment and materials. Also, includes instructional methods and materials in teaching of office practice and business machines, class organization plans, equipment needs, cooperative training, standards and evaluation. For the inexperienced business teacher education student. (3F, W) **Frost, Stoddard**

**180. Methods of Teaching Shorthand and Transcription.** Instructional methods and materials in the teaching of shorthand, transcription, business English, filing and secretarial procedure. Includes factors affecting speed building and standards and grading in shorthand, and transcription. For the inexperienced business teacher education student. (3F, Sp) **Frost, Olsen**

**185. Managing Personal Finances.** Designed to aid in meeting the growing complexity of per-

sonal finances; how to avoid financial entanglements, installment buying, borrowing money, owning or renting a home, investing and speculation in securities, everyday legal problems dealing with illness, death, personal taxes. (5F, Sp, Su) **Wood**

**189. Principles of Business Education.** The study of current problems in Business Education and a survey of the recent literature in the field. (3F, Sp) **Ivarie**

**210. Improvement of Instruction in Typewriting.** A study of the basic factors of typewriting skill and improvement of methods and techniques in typewriting for the experienced business teacher. (3Su and as needed) **Nellermoe, Stoddard**

**220. Improvement of Instruction in Shorthand and Transcription.** Designed for in-service teachers of shorthand and transcription. A study of improved methods and techniques applicable to the teaching of shorthand and related courses in the high school and junior college level. (3Su and as needed) **Olsen, Stoddard**

**230. Improvement of Instruction in Bookkeeping and Accounting.** Designed for the in-service teacher of bookkeeping and accounting. A study of improved methods and techniques for in-service business teachers at the secondary school and college levels. (3Su and as needed) **Motley**

**240. Improvement of Instruction in Basic Business.** An analysis of methods and techniques employed in the teaching of basic business courses. Also, study of the function and purpose of the basic business courses. (3Su and as needed) **Motley**

**245. Cooperative Programs in Business Education.** Workshop and research activities for the high school teacher supervising a work-experience program. (3Su) **Ivarie**

**250. Issues and Trends in Business Education.** An analysis of the pertinent issues and trends in education that pertain to a business as well as those issues and trends that are inherent in business education itself. (3Su and as needed) **Ivarie, Stoddard**

**255. Office Technology.** Adjustment to technological changes that are occurring in office occupations. A look at data systems, peripheral office equipment, and methods pertinent to curriculum improvement. (3Su and as needed) **Ivarie, Motley**

**260. The Business Curriculum.** An analysis of the principles, concepts, methods, and procedures of studying, changing and construction of business offering in the secondary schools and colleges so as to better meet the needs of students. (3Su and as needed) **Ivarie, Stoddard**

**262. Evaluation of Business Education.** Detailed analyses of survey and measuring devices in business education subjects. (3Su and as needed) **Stoddard**

**264. Implementation of Business Education.** Departmental and classroom problems related to the organization and implementation of business education curriculums, equipment guidance, in-service training, and personnel. The regulation of vocational business education programs by state and federal agencies. (3Su and as needed) **Ivarie**

**266. Philosophy of Vocational Business Education.** Development of a modern philosophy of vocational business education. (3Su and as needed) **Motley**

**267. Supervised Work Experience.** Active participation in approved business offices for the purpose of gaining work experience directly related to office education. Selection of training stations must be approved by college supervisor at least one quarter ahead of registration. Cr. arranged. (Su and as needed) **Stoddard**

**268. Vocational Team Teaching.** Student teaching at the graduate level in approved high school cooperative work experience programs or simulated block programs. A team teaching philosophy will be employed as the cooperating teacher and student teacher attempt to provide for students' individual differences. Cr. arranged. (Su and as needed) **Stoddard**

**270. Workshop in Business Education.** Special workshops on selected issues, trends, and principles in Business Education. (1-6Su) **Staff**

**271. Workshop in Business Education.** Intensive one- to five-day workshop on pressing issues and trends in business education. (1Su) **Staff**

**272. Workshop in Business Education.** Intensive one- or two-week workshop on principles, issues and trends in business education. (2Su) **Staff**

**273. Workshop in Business Education.** A two-week workshop on current trends and issues applying to specialized or general fields in business education. (3Su) **Staff**

**280. Seminar in Business Education.** An analysis of research methods applicable to business education. (2Su and as needed) **Ivarie**

**290. Research in Business Education.** Selection and researching the problem or problems required under Plan A or Plan B of the graduate study requirement. Credit arranged. (F, W, Sp, Su) **Ivarie, Stoddard**

**295. Independent Research and Reading.** Credit arranged. (F, W, Sp, Su) **Staff**

## Distributive Education Major

The Distributive Education curriculum also leads toward qualifying for a teaching certificate. This program is often referred to as marketing education in that those supervising it train high school students and adults to become better salesmen and retailers through cooperative work experience programs in local businesses. Consult Professor Gary R. Smith for full details.

Close cooperation is maintained between the Business Education Department, the College of Education, and the Vocational Division of the State Department of Education in providing the necessary course requisites in training a prospective teacher for this specialized profession. The following are required for those interested in this field:

Acct 1	Introductory Accounting .....	3
Acct 2	Introductory Accounting .....	3
BA 4	Business Law .....	2
BA 5	Business Law .....	2
BA 6	Business Law .....	2
BA 63	Salesmanship .....	2
BA 143	Business Communications .....	3
BA 151	Marketing Principles .....	5
BA 152	Marketing Problems and Cases ....	5
BA 156	Principles of Advertising .....	5
BA 161	Principles and Problems in Retailing .....	5
BA 171	Personnel Administration .....	5
BE 150	Philosophy of Distributive Edu- cation .....	3
BE 155	Methods of Teaching DE and Cooperative BE .....	3
BE 178	Methods of Teaching Business— Non-skilled .....	3
BE 185	Managing Personal Finances .....	5
BE 189	Principles of Business Education...	3
Econ 51	General Economics .....	5
Econ 52	Economic Problems .....	5
OA 92	Business Machines .....	2

The following courses are strongly recommended, although not required, for Distributive Education majors:

Acct 3	Introductory Accounting .....	3
BA 133	Management Concepts .....	3
BA 140	Insurance or .....	3
BA 141	Real Estate or .....	3

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BE 179	Methods of Teaching Typewriting and Office Practice .....	3
CS 11	Intro to Computer Science .....	3
Econ 127	Social Security .....	3
OA 42	Intermediate Typewriting .....	2
Sp 21	Intermediate Public Speaking .....	3

In addition, the following courses must be completed to qualify for secondary school certification in the state of Utah:

<sup>1</sup> Psy 53	Elementary General Psychology ....	5
Psy 100	Human Growth and Development..	3
Psy 106	Educational Psychology .....	3
PH 155	Public Health .....	3
ED 126	Principles of Secondary Education .....	3
ED 127	Student Teaching Seminar .....	3
<sup>2</sup> ED 129	Student Teaching .....	6
<sup>2</sup> ED 130	Student Teaching .....	6
ED 150	Organization and Administration..	3

BE 155, Methods of Teaching DE and Cooperative BE, should be taken in the Junior year if student teaching is to be taken in the Fall of the Senior year.

Students may count BE 155 toward the 33-credit professional certification requirement.

### Office Administration Major

The program of Office Administration is arranged on a four-year degree pattern. Students who initially enroll for only two years may change to a four-year degree program by completing all of the following courses in addition to University lower division group requirements.

OA 42	Intermediate Typewriting .....	2
OA 43	Advanced Typewriting .....	2
OA 65	Records Administration .....	3
OA 75	Shorthand I or equivalent proficiency .....	3
OA 76	Shorthand II or equivalent proficiency .....	3
OA 77	Shorthand III or equivalent proficiency .....	3
OA 85	Office Data Systems .....	3
OA 92	Business Machines .....	2
OA 141	Dictation and Transcription I ....	5
OA 142	Dictation and Transcription II ....	5
OA 167	Office Practice .....	2
OA 175	Office Management .....	3
OA 186	Secretarial Procedures .....	3
CS 157	Programming Business Problems..	3

Acct 1	Introductory Accounting .....	3
Acct 2	Introductory Accounting .....	3
BA 4	Business Law .....	2
BA 5	Business Law .....	2
BA 6	Business Law .....	2
BA 143	Business Communications .....	3
BA 151	Marketing Principles .....	5
BA 171	Personnel Administration .....	5
BE 185	Managing Personal Finances .....	5
CS 11	Introduction to Computer Science ..	3
Econ 51	General Economics .....	5
Econ 52	Economic Problems .....	5
Psy 53	Elementary General Psychology....	5

The following courses are strongly recommended, although not required, for Office Administration majors:

Acct 3	Introductory Accounting .....	3
BA 133	Management Concepts .....	3
BA 140	Insurance .....	3
BA 161	Principles and Problems of Retailing .....	5
Econ 127	Social Security .....	3
Speech 21	Intermediate Public Speaking ....	3

To enroll in any skill course the student must have a grade of "C" or better in the preceding course in the same skill.

Transfer students are permitted to make reasonable substitutions with departmental approval.

### Office Administration Courses

**40. Remedial Typewriting.** Remedial typewriting, with emphasis on improvement of accuracy and speed. Enrollment limited to students typing less than 60 wpm. (1F, W, Sp) **Lundstrom**

**41. Elementary Typewriting.** For students with no previous training in typewriting. Designed to develop a thorough knowledge of the keyboard and machine parts. Personal-use typing problems, centering, letter styles. (2F, Sp) **Staff**

**42. Intermediate Typewriting.** Assumes previous training in typewriting. Emphasis on skill building, typing of letters, envelopes, manuscripts, business forms and tabulation exercises. Prerequisite: OA 41 or equivalent. (2F, W, Sp, Su) **Wood**

**43. Advanced Typewriting.** The development of number proficiency, statistical tabulation and typing on business forms, rough drafts, or stencils for duplication. Prerequisite: OA 42. (2W, Sp) **Wood**

<sup>1</sup>Prerequisite to Psy 100 and Psy 106.

<sup>2</sup>BE 155 must be completed prior to student teaching.



**65. Records Administration.** Training in alphabetical, numeric, subject, decimal, geographic, and soundex methods of filing. Indexing, coding, and filing of letters and cards. (3F, W, Sp, Su) **Frost**

**75. Fundamentals of Shorthand I.** Assumes no previous training in shorthand. Study of fundamentals of Gregg shorthand. (3F, W) **Olsen**

**76. Fundamentals of Shorthand II.** Continuation of course 75. Introduction of new-matter dictation. Prerequisite: OA 75 or equivalent. (3F, W, Sp) **Olsen**

**77. Fundamentals of Shorthand III.** Continuation of course 76. Intensive practice in new-matter dictation. Prerequisite: OA 76 or equivalent. (3F, W, Sp) **Olsen**

**78. Refresher Shorthand.** A shorthand review course for those who need speed building and theory review to prepare for employment or for continuation in advanced shorthand and transcription. Taught only as extension or a 5-week summer course. (2Su and as needed) **Staff**

**81. IBM Key punch Speedbuilding.** Three one-hour lab periods per week. Prerequisite: One year of typing. (2F) **Staff**

**85. Office Data Systems.** A survey of the development and contribution of better ways and means of keeping records as factors in providing information for management in its decision making. Intensive study of basic principles involved in data storage, processing, and retrieval by modern electric office equipment. (3F, Sp) **Motley**

**92. Business Machines.** Basic training in the use of ten-key adding-listing machines, printing calculators, and rotary calculators. (2F, W, Sp, Su) **Stoddard**

**141, 142, 143. Dictation and Transcription I, II, III.** A continuation of the study of shorthand fundamentals and a development of transcription skill. Admission to 141 should require a minimum dictation speed of 80 words a minute and a minimum grade of "C" in the course immediately preceding the course in which a student wishes to enroll. Prerequisites: OA 77 or equivalent, and OA 42. (5F, 5W, 5Sp) **Frost, Olsen**

**167. Office Practice.** Training in use of dictating and transcribing machines, photocopy equipment, varityper, and spirit, stencil and offset duplicators. Prerequisite: OA 42. (2F, W, Sp, Su) **Hanson**

**175. Office Management.** Emphasis on principles of office management, duties and responsibilities of the office manager, types of organization, methods of control, office arrangement and equipment, job analysis, selection, employment and training of employees. Prerequisites: Economics 51, 52. (3F, Sp) **Frost, Motley**

**186. Secretarial Procedures.** Office routines are studied, with special emphasis on use of reference books, transportation and travel, use of telephone, telegraph, and cablegram services, financial records, writing for publication, minutes and meetings. (3Sp) **Frost, Olsen**

## **Combination Major in Office Administration and Family Life**

This curriculum is designed for women who desire sufficient secretarial training to provide career opportunities outside the home as well as a basic training for family living.

The Office Administration program is combined with the Family Life program. Completion of these requirements, in addition to University and group requirements, leads to a Bachelor of Science degree.

## **Office Administration Courses**

	<b>Credits</b>
OA 42 Intermediate Type .....	2
OA 43 Advanced Type .....	2
OA 65 Records Administration .....	3
OA 85 Office Data Systems .....	3
OA 92 Business Machines .....	2
OA 141 Dictation and Transcription I .....	5
OA 142 Dictation and Transcription II .....	5
OA 167 Office Practice .....	2
OA 175 Office Management .....	3
OA 186 Secretarial Procedures .....	3
<sup>1</sup> Acct 1 Introduction to Accounting .....	3
BA 4 Business Law .....	2
BA 5 Business Law .....	2
BA 20 Introduction to Business .....	3
BA 143 Business Communications .....	3
<b>Total .....</b>	<b>43</b>

## **Family Life Courses**

42 credits with not fewer than nine in each department.

	<b>Credits</b>
CT 10 Pattern Designing and Clothing Construction .....	8
CT 24 Introduction to Textiles .....	3
CT 75 Home Furnishings .....	3
CT 105 Clothing Selection and Consumption .....	2

<sup>1</sup>It is recommended that Acct 2 also be completed (3 Credits).

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CT 106	Behavioral Science Aspects of Clothing .....	2
CT 120	Comparative Construction Techniques .....	5
CT 135	History of Textiles and Costume .....	3
CT 140	Draping .....	3
CT 170	Flat Pattern Designing .....	3
CT 180	Tailoring .....	3

### Family and Child Development

FCD 20	Preparation for Marriage and Family Relations .....	3
FCD 67	Early Childhood .....	3
FCD 68	Preschool Laboratory .....	3
FCD 77	Child from 6-12 .....	3
FCD 100	Human Growth and Development .....	3
FCD 108	Guidance of the Young Child .....	3
FCD 109	Play-School Education .....	2
FCD 115	Growth of the Infant .....	3
FCD 120	Marriage .....	3
FCD 140	The Family in its Social Setting .....	3
FCD 150	Seminar .....	2
FCD 185	Family in Middle and Later Years .....	3

### Food and Nutrition

FN 22	Principles of Nutrition .....	3
FN 23	Laboratory of Nutrition and Food Preparation .....	3
FN 25	Meal Preparation for the Family .....	3
FN 107	Science in Relation to Food Preparation .....	3
FN 108	Science in Relation to Food Preparation .....	3
FN 109	Experimental Foods .....	3
FN 135	Weight Control .....	3
FN 140	Nutrition .....	4
FN 146	Food Technology .....	2
FN 150	Seminar .....	1

### Household Economics and Management

HEM 65	Housing .....	3
HEM 100	Household Equipment .....	3
HEM 110	Advanced Equipment .....	3
HEM 149	Home Management .....	3
HEM 150	Home Management House .....	4
or		
HEM 151	Home Management Problems .....	4
HEM 155	Family Finances .....	3
HEM 165	Advanced Housing .....	3
HEM 175	Consumer Education .....	3

### Composite Major in BE, DE and Fashion Merchandising

The Department of Business Education and Office Administration cooperates with the Department of Clothing and Textiles to offer a composite major program of

studies in Business Education, Distributive Education, and Fashion Merchandising. This major is designed to prepare persons who are well founded in a knowledge of marketing, fashion merchandising, and teaching procedures as teachers of Distributive Education at the secondary and post high school levels. Such individuals should be capable of providing a unique contribution to the preparation of persons in the retail merchandising field, especially that of textiles and fashion merchandising.

Students graduating with a composite major in Business Education, Distributive Education, and Fashion Merchandising shall complete the following minimum course work, including classes listed below, with a minimum of 60 credits:

Acct 1, 2	Introductory Accounting or .....	6
Acct 100	Survey of Accounting Principles ..	4
BA 4, 5	Business Law .....	4
BA 63	Salesmanship .....	2
BA 151	Marketing Principles .....	5
BA 156	Principles of Advertising .....	5
BA 161	Principles and Problems of Retailing .....	5
BE 150	Philosophy of Distributive Education .....	3
BE 155	Methods of Teaching DE and Cooperative BE .....	3
BE 178	Methods of Teaching Business (non-skilled) and/or .....	3
BE 185	Managing Personal Finances .....	5
BE 189	Principles of Business Education ..	3
OA 92	Business Machines .....	2
CT 5	Design in Everyday Living .....	3
CT 24	Introduction to Textiles .....	3
CT 105	Clothing Selection and Consumption .....	2
CT 186	Fashion Analysis .....	3
CT 192	Field Experience in Clothing and Textiles .....	3

Six to nine credits of additional work must be earned in classes selected from courses listed below:

CT 15	Clothing Selection for Men .....	2
CT 106	Behavioral Science Aspects of Clothing .....	2
CT 115	Fashion Design .....	3
CT 135	History of Costume and Textiles ....	5

In addition, the following courses must be completed to qualify for secondary school certification in the state of Utah:

<sup>1</sup> Psy 53	Elementary General Psychology ....	5
Psy 100	Human Growth and Development..	3
Psy 106	Educational Psychology .....	3
PH 155	Public Health .....	3

Ed 126	Principles of Secondary Education	3
Ed 127	Student Teaching Seminar .....	3
<sup>2</sup> Ed 129	Student Teaching .....	6
<sup>2</sup> Ed 130	Student Teaching .....	6
Ed 150	Organization and Administration ..	3

<sup>1</sup>Prerequisite to Psy 100 and Psy 106

<sup>2</sup>BE 155 and BE 178 and/or BE 179 must be completed prior to student teaching.

## Department of

# Economics

**Head:** Associate Professor Reed R. Durtschi  
Office in Main 322

**Professors** Leonard J. Arrington, Robert P. Collier; **Professors Emeritus** Vernon L. Israelsen, Evan B. Murray; **Associate Professors** Bartell C. Jensen, Glenn F. Marston; **Assistant Professors** Gary B. Hansen, Kenneth S. Lyon, Roger A. Sedjo.

**Degrees:** Bachelor of Arts (BA), Bachelor of Science (BS), Master of Arts (MA), Master of Science (MS), Doctor of Philosophy (PhD).

**Major:** Economics.

Economics majors must earn a minimum of 30 credits in economics courses with numbers above 101. The following courses or their equivalents are required: Mathematics 35 and 66; Accounting 1, 2, and 3 or Accounting 100; Applied Statistics 131 and 132 or Business Administration 131 and 132; Economics 51, 52, 106, 107, 108, 165, 170, 140 or 180, and one course from the labor group—123, 125 or 126.<sup>1</sup> Additional courses may be selected in accordance with the plans and interests of the students. Students contemplating graduate work in Economics should take Economics 190, 191 and 192.

## Economics Courses

<sup>2</sup>51. **General Economics.** For any university student regardless of major. Principles and institutions underlying operations of the economic system. (5F, W, Sp, Su) **Staff**

<sup>2</sup>52. **Economic Problems.** Continuation of Economics 51. The emphasis in this second course is on the economics of a competitive market; commodity markets and factor markets are analyzed. (5F, W, Sp, Su) **Staff**

<sup>2</sup>100. **Elements of Micro Economic Theory.** A principles course in the economics of supply, demand and pricing offered to students who are prepared to use the shortcuts offered by a mathematical approach to economics analysis. (3W) **Staff**

<sup>2</sup>101. **Elements of Micro Economic Theory.** Continuation of Economics 100. The emphasis in this course is the general area of national income economics with an integration of financial institutions. (3Sp) **Staff**

106. **History of Economic Thought.** Study of the origin and development of economic theories of leading thinkers in Western civilization from 1750 to now. (3F) **LeBaron**

107. **Micro Economic Theory.** Theory analyzing the economic behavior of households and business firms within the framework of private capitalism. (4F, W, Sp) **Durtschi**

<sup>1</sup>Econ 123, 125, 126 and 170 are not required for students who are not citizens of the United States.

<sup>2</sup>Econ 51 and 52 or Econ 100 and 101 are prerequisites for all upper division classes except 170, 174 and 175.

## 90 College of Business and Social Sciences

- 108. Income and Employment Theory.** An analysis of the underlying causes of unemployment, economic instability, inflation and economic growth. (4F, W, Sp) **Durtschi**
- 123. Introduction to Labor.** Provides a broad view of the economics, social and political sources and manifestations of the labor-management relationship. (3F) **Hansen**
- 125. Trade Unionism and Collective Bargaining.** Describes and analyzes the formulation and administering of collective agreements between labor and management. (3W) **Hansen**
- 126. Trade Unionism and the Law.** The legal framework of the trade union activity; restrictive, permissive, and promotional legislation; the judiciary and labor. (3W) **Murray**
- 127. Social Security.** Survey of the main divisions of social security legislation; workmen's compensation, legal minimum wage, regulation of hours, unemployment compensation, old age insurance, family wage systems and health insurance. (3Sp, Su) **Murray**
- 128. Labor Force and Manpower Economics.** Among topics studied are the composition of the labor force, programs to combat joblessness and poverty, job-seeking and employment practices and the economic effects of unions. (3Sp) **Hansen**
- 135. Transportation Economics.** The emphasis is upon railroad transportation in the United States. Economic principles that underlie rate structures and work of regulatory agencies. (3W) **Israelsen**
- 140. International Economic Relations.** Basic economic relationship between industrial nations, trade restrictions, international debt and finance and means of promoting progress based on sound economics. (5Sp) **Sedjo**
- 147. Public Utilities.** A study of the characteristics of public utilities, regulatory commissions, rate structures, rate discrimination, finance, and rates of returns. (3Sp) **Israelsen**
- 150. Communist Economics.** History and economic theories of Marxism, the organization of Communist economies, and the economic policies and problems of Russia, China, and other Communist countries. (3Sp) **Arrington**
- 155. Public Finance and Fiscal Policies.** Principles involved in establishing the general property tax, income tax, death taxes, taxes upon business, social insurance taxes; effects of taxes in the American Economy; war and postwar finance. (3W) **Israelsen**
- 156. Special Problems in State and Local Finance.** A critical examination of the tax structure of Utah and its ability to finance public services. Alternative sources of revenue and the school finance program will receive special consideration. (2W) **Israelsen**
- 165. Money and Banking.** Development of our present monetary and banking system; a critical analysis of central banking. (5F, W, Sp, Su) **Lyon**
- 170. Economic History of the United States.** Development of agriculture, industry, labor, transportation and finance from colonial times to now. (5W) **Arrington**
- 171. Economic and Business Fluctuations.** Instability in aggregate economic activity and rate of growth. Business cycles—their history, nature, and causes. Forecasting and control of instability and cycles. (5F, W, Sp) **Collier**
- 174. Business and Government.** The role of the giant corporation in modern economic life; public regulations of monopoly and competitive practices; international and domestic cartels; alternative policy toward business. (3F, Su) **Staff**
- 175. Economic History of Far West.** Development of agriculture, industry, transportation, and finance of the Far West with special attention to the economic development of Utah. (3) **Arrington**
- 180. Economic Development.** Theories and principles of economic development, characteristics and problems of underdeveloped and developing countries, alternative techniques and policies for the promotion of growth and development. (3W) **Whaley**
- 190. Quantitative Economics I.** A study of the principal mathematical formulations used in economic analysis. Designed to acquaint the student with those aspects of economic theory typically formulated in mathematical terms. Prerequisites: Math 35 and Econ 107. (3F) **Jensen**
- 191. Quantitative Economics II.** Continuation of Economics 190. Prerequisite: Econ 190. (3W) **Jensen**
- 192. Quantitative Economics III.** Continuation of Economics 191. Prerequisite: Econ 191. (3Sp) **Jensen**
- 200. Thesis.** Investigations by graduate students. Credit granted according to work done. (F, W, Sp) **Staff**
- 201. Readings and Conferences.** Credit arranged. (F, W, Sp) **Staff**
- 202. Independent Research.** Credit arranged. (F, W, Sp, Su) **Staff**
- 203. Seminar in Economic Research.** An intensive study of the methods, tools, and objectives of economic research: statistics, economic analysis, and economic history. Permission of instructor required. (3F) **Arrington**

**204. Modern Economic Thought.** An intensive study of the main currents in recent economic thought. Prerequisite: Econ 106. (3F) **LeBaron**

**207. Advanced Price Theory.** A critical review of a few major topics in price and distribution theory. Open to graduate students and Seniors with adequate preparation. Prerequisite: Econ 107. (3F) **Gardner**

**208. Advanced Income Theory.** A critical review of the major topics in aggregate economic theory. Prerequisite: Econ 108. (3W) **Durtschi**

**211. Literature of Economics.** An intensive study of the bibliographical materials and literature of economics. Permission of instructor required. (2W) **Arrington**

**225. Labor Economics Seminar.** Applications of principles and practices of American trade-unionism brought to light through individual and group research projects; analysis and evaluation of current issues in labor activities. Prerequisite: Econ 123 or 125. (3Sp) **Hansen**

**240. Seminar in International Trade.** A critical review of the major topics in international trade theory and practice. Prerequisite: Econ 140. (3W) **Sedjo**

**255. Seminar in Public Finance.** A critical review of the current literature in the field of public finance. Prerequisite: Econ 155. (3Sp) **Staff**

**265. Advanced Money and Banking.** A critical review of the current literature in the field of money and banking. Prerequisite: Econ 165 and 107. (3W) **Lyon**

**270. Economic History Seminar.** The methods and literature of economic history. (3Sp) **Arrington**

**280. Advanced Economic Development.** An intensive study of the theories of development and their application. (3F) **Roberts**

**290. Introduction to Econometrics.** Introduction to the problems of construction and estimation of single equation models. Emphasis is placed on economic interpretation as well as methodology. A knowledge of calculus and statistics is required. (3F) **B. Jensen**

**291. Theory of Econometrics.** An investigation into errors in variables, autocorrelation, multicollinearity, heteroscedasticity, lagged variables, dummy variables, as encountered in single equation models. (3W) **B. Jensen**

**292. Advanced Theory of Econometrics.** Simultaneous equation estimation including identification and the following estimation procedures: indirect least squares, multiple-stage least squares, full information maximum likelihood, and k-class estimators. (3Sp) **B. Jensen**

**307. Price Theory.** A graduate level course in allocation and distribution theory. Prerequisite: Econ 207. (3Sp) **Gardner**

**308. Income Theory.** A graduate level course in advanced income, monetary and fiscal analysis. Prerequisite: Econ. 208. (3Sp) **Lyon**

## Department of

# History

(History, Geography)

**Head:** Professor S. George Ellsworth  
Office in Main 317

**Professor** Edwin L. Peterson; **Professors Emeritus** J. Duncan Brite, Daryl Chase; **Associate Professor** Stanford O. Cazier; **Assistant Professors** Douglas D. Alder, Klaus J. Hansen, Gary L. Huxford, William F. Lye; **Instructors** C. Blythe Ahlstrom, Clifford B. Craig, Lucille Pratt; **Lecturer** Serge N. Benson.

**Degrees:** Bachelor of Science (BS), Bachelor of Arts (BA), Master of Science (MS), Master of Arts (MA).

**Major:** History.

The department offers programs leading to the Bachelor of Science, Bachelor of Arts, Master of Science, and the Master of Arts degrees in History.

**Major in History.** For a major in History the student must complete 45 credits in History. The minor (a minimum of 18 credits) should be in a closely related field



in the Social Sciences or Humanities. The student should complete as soon as possible survey courses in the history of World Civilizations, History 4 and 5, and American Civilization, History 20. Upon completion of these three courses the student should take History 190, Sources and Literature of History. The student should then take such upper division courses as will satisfy his particular interest. History 192, Historical Synthesis, and History 193, Introduction to Historical Research, should be taken in the senior year.

The study of History requires an understanding of many fields of human endeavor. The student majoring in History should take his minor in one of the Social Sciences or Humanities, such as Economics, Political Science, Geography, Sociology, Anthropology, English, Art, or Philosophy, for example. He should take courses in the history of World, English and American Literature, history of art, history of music, history of science, history of political thought, history of economic developments, and become conversant with these aspects of the achievements of mankind.

Those who plan to do graduate work in History are encouraged to complete at least two years of French and German or Spanish as an undergraduate.

Those who plan to obtain a teaching certificate should consult in the Sophomore year with the College of Education to assure eligibility for teacher training and the right course program for certification.

A grade of "C" or better is required in any course in History which is used to meet the requirements for a major in History.

**Minor in History.** A minor in History consists of 18 or more

credits. History 1, 2, and 3, or History 4 and 5, History 20, and History 190 are recommended.

History constitutes the major study in the subject matter of the Social Studies curriculum of the secondary schools. Those who plan to teach in the secondary schools should either 1) pursue work leading to the major in History and to the secondary certificate, or 2) pursue work leading to the teaching major in History and the secondary certificate. The former plan is regarded as preferable. The History faculty advises History majors; teaching majors may be advised by either the History faculty or the Education faculty.

**Teaching Major in History.** For a teacher major in History the student must complete a minimum of 40 credits in History and a minimum of 24 credits in a minor. The teaching major should begin his program with History 4, 5, and 20. History 190 should be taken before practice teaching. A teaching major in History should include a broad foundation in the Social Sciences and therefore the minor should be in one of the Social Sciences. Economics, Political Science, Geography, and Sociology are recommended. Upper division courses in History and work in the minor and allied fields should be selected in consultation with one's adviser.

**Teaching Minor in History.** A teaching minor in History consists of 24 credits. History 4, 5, 20, and 190 are especially recommended.

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

**College Teaching.** There is an increasing demand for college and university history teachers. Students of capacity and dedication are encouraged to give serious consideration to this profession. Appointment to a major college department usually requires the PhD degree. Interested students should consult History faculty members, and check on fellowships and assistantships.

**Master of Science or Master of Arts in History.** Programs for either of the Master's degrees are described in the Catalog of the School of Graduate Studies. Those who are interested in these programs should obtain a copy of the Graduate Catalog and consult with a member of the History faculty.

**American Studies.** The departments of English and Journalism, History, and Political Science cooperate in administering the graduate program leading to the Master of Science and the Master of Arts degrees in American Studies. See the catalog section on English for a statement of that program.

**Career Opportunities.** A solid preparation in History qualifies a person for a career in several fields. Most majors in History teach in the public schools or serve in colleges and universities as teachers and authors. Careers outside the classroom are also open to specialists in History. Libraries and archives on the city, county, state, and national level frequently hire historians who have an interest in the management of books and manuscripts and who have some training also in Library Science and archives management. History majors who also have strong preparation in Political Science and Economics find oppor-

tunity in various branches of the federal government.

History majors are encouraged to achieve that scholastic level which permits them to affiliate with and attend meetings of Phi Alpha Theta, the national honorary history fraternity. Professor C. Blythe Ahlstrom is adviser to Phi Alpha Theta. Interested persons should see him.

## Institute of Utah Studies

Please see Catalog section on Research and Institute Programs, specifically page 405.

## History Courses

### Basic Lower Division

1. **Man and Civilization I.** A survey of the major civilizations of the world, with emphasis on the European tradition, primarily concerned with the cultural development of man and the arts of civilization. Political, economic, and social institutions of major significance are studied, as well as the development of the arts and sciences. From the earliest times to about 1500. Not open to those who have had History 4. (3F) **Staff**
2. **Man and Civilization II.** Continuation of History 1. From about 1500 to 1850. Not open to those who have had History 5. (3W) **Staff**
3. **Man and Civilization III.** Continuation of History 2. From about 1850 to the present day. Not open to those who have had History 5. (3Sp) **Staff**
4. **Ancient World Civilizations.** The history of the world from earliest times to about 1500. A more detailed course than History 1. Not open to those who have had History 1. (5F, W, Sp) **Staff**
5. **Modern World Civilizations.** Continuation of History 4. From about 1500 to the present day. Not open to those who have had History 2 or 3. (5F, W, Sp) **Staff**
20. **American Civilization.** A basic one-quarter course in the fundamentals of American history. Successful completion of this course meets the American Institutions requirement established by the State Legislature. (5F, W, Sp) **Staff**

## History of Europe

105. **Greek History.** Greek civilization to the Roman conquest, 146 B.C. Emphasizes political, social, intellectual, and artistic developments and contributions. (5F) **Ellsworth**

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**106. Roman History.** From the earliest times to the decline of the Roman Empire in the West in the fifth century A.D. (5W)

**Ellsworth**

**107. The Rise of Christianity.** The Early Christian Church, with special emphasis on a study of the teachings and impact of Paul's letters. The Church in its Hebrew setting, its growth and development in the Graeco-Roman world. (5F)

**Chase**

**111. Medieval Europe.** (500-1500 A.D.) Political, economic, social, and cultural developments during the Middle Ages. (3W)

**Brite**

**114. History of Science I.** History of Science from antiquity through Copernicus. (3Su)

**Staff**

**115. History of Science II.** History of Science since Galileo. (3Su)

**Staff**

**121. Germany Since the Reformation.** Historical development of Germany since the Reformation to the present; backgrounds of "the German problem," Germany under Bismarck, World War I, Germany under Hitler, post-war Germany. (5W)

**Alder**

**124. Renaissance and Reformation.** (1250-1600) (5F)

**Brite**

**125. Absolute Monarchies.** (1589-1789) (3W)

**Brite**

**126. French Revolution and Napoleon.** (1789-1815) (3Sp)

**Brite**

**127. Nineteenth Century Europe.** Political and economic developments between 1815 and 1914. (3Sp)

**Brite**

**128. Twentieth Century World.** Political and economic developments in Europe, America, Asia, and Africa since the end of World War I. (3F, Sp)

**Brite, Alder, Hansen**

**138. History of Russia to 1917.** From the earliest times to the Revolution. (3F)

**Brite**

**139. History of the Soviet Union.** From the Revolutions of 1917 to the present day. (3W)

**Brite**

**161. England to 1603.** From the earliest times to the death of Elizabeth. (3F)

**Brite**

**162. England Since 1603.** From King James I to the present day. (3W)

**Brite**

**163. The British Empire.** Rise and decline of the British Empire in the modern world. (3)

**Staff**

**165. Expansion of Europe.** The conquest and exploitation of the world by Western Europeans between 1400 and the present, emphasizing the methods, the motives and the results of this European domination in various parts

of the world; the acculturation and resurgence against foreigners; and the decline of western power. (5Sp)

**Pratt**

**166. European Cultural History I.** Modern European intellectual history to the nineteenth century, with emphasis on the relations between patterns of thought and society. (3F)

**Hansen**

**167. European Cultural History II.** European intellectual and social history in the nineteenth century, with emphasis on the development of social institutions and ideas. (3W)

**Hansen**

**168. European Cultural History III.** European intellectual and social history in the twentieth century. (3Sp)

**Hansen**

**170. A Study of War and Peace in History.** A study of the causes of war and the conditions for peace, considered in the historical context of various civilizations at various periods of time, selected with the view to an understanding of the complexity of the problem and the conditions necessary for a possible solution. See catalog section on The Center for the Study of the Causes of War and the Conditions for Peace. (3F, S)

**Chase**

## History of the United States

**135. The Frontier in American History.** The occupation of the territory of the United States, the successive westward-moving frontiers from colonial times to the end of the nineteenth century. The Atlantic frontier, the trans-Appalachian frontier, the trans-Mississippi, and the Far Western frontiers are considered in turn. (3W)

**Ellsworth**

**137. History of Utah.** Geography and native peoples, early explorations, political, social, and economic developments to the present. (5F, W, Sp)

**Ellsworth**

**141. Colonial America.** The colonial period of American history from the European background to 1775. (3F)

**Huxford**

**142. The New Nation.** The course of American history from the beginning of the American Revolution to the 1820's. (3W)

**Huxford**

**143. The Jacksonian Era.** Political, economic and cultural developments from the 1820's to 1850, emphasizing the development of political parties and the character of Jacksonian democracy. (2Sp)

**Ahlstrom**

**144. The Civil War and Reconstruction.** (3W)

**Cazier**

**145. Development of Modern America.** (1877-1900) Political, economic and cultural developments; reform movements; and foreign affairs from the Reconstruction Period to the establishment of the United States as a world power in 1900. (3F)

**Ahlstrom**

146. **The Progressive Era.** Emphasis on political, economic, and social reform from the turn of the century to the 1920's. (1900-1920's) (3W) **Ahlstrom**

147. **Recent America.** Domestic and foreign affairs of the United States since the 1920's, emphasizing the Great Depression, World War II and America's contemporary problems. (3Sp) **Ahlstrom**

150. **Comparative American Religions.** An historical, comparative study of religions and major churches in America. The development of the major faiths and churches in America, their role in American life and shaping the American tradition; church and state relations in America. (3S) **Chase**

155. **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. (5F) **Cazier**

165. **Expansion of Europe.** The conquest and exploitation of the world by Western Europeans between 1400 and the present, emphasizing the methods, the motives and the results of this European domination in various parts of the world; the acculturation and resurgence against foreigners; and the decline of western power. (5Sp) **Pratt**

171. **Constitutional History of the United States.** (5W, Sp) **Huxford**

173. **Immigration to the United States.** Survey of causes of emigration, the voyages, and initial reception as well as eventual acculturation within the United States, emphasizing the immigration from Europe. (3Sp) **Pratt**

## History of Africa and Asia

151. **History of Africa I.** Geography, ethnology, and early history of Africa to the coming of the colonial powers. (3W) **Lye**

152. **History of Africa II.** From the coming of the colonial powers, through the Colonial Period to the present movements for independence. (3Sp) **Lye**

175. **East Asia to 1800.** Development of the civilizations of East Asia—China, Japan, and Korea—from their origin to the nineteenth century. (3) **Staff**

176. **East Asia Since 1800.** Emphasis on China and Japan in the nineteenth and twentieth centuries. (5) **Staff**

177. **Chinese Civilization.** (3) **Staff**

178. **Japanese Civilization.** (3) **Staff**

179. **History and Civilization of India.** The development of Indian civilization and major currents in her history from earliest times to the present. (3W) **Lye**

## History of Latin America and Canada

169. **History of Canada.** From earliest times to the present. (3F) **Lye**

181. **Latin America to 1830.** Geography, pre-Columbian peoples, exploration and conquest and colonization by European powers, political and social and economic developments, international rivalries and ineffective mercantilism, prominent revolutionists and the independence wars. (3F) **Pratt**

182. **Latin America since 1830.** The new nations emerging from the independence wars; the social, economic and political development of the twenty Latin American nations in the nineteenth and twentieth centuries. (3W) **Pratt**

184. **History of Mexico.** The social, economic, and political history from colonial times to the present, with major emphasis on the national era. (3W) **Pratt**

185. **History of United States-Latin American Relations.** The diplomatic, economic and cultural relations between the United States and the twenty Latin American nations. (3F) **Pratt**

186. **Economic History of Latin America.** The economy as it developed in colonial days, the economic problems of the new nations in the 19th century, the push to industrialize as well as maintain raw material production in this 20th century, the need for capital investment and government and international efforts to provide this. (3) **Pratt**

## Senior Professional Courses

190. **Sources and Literature of History.** General reference works, bibliographies and guides to the study of European, American and Asian history. For all persons preparing to teach or write history. Prerequisites: History 1, 2, 3, or 4 and 5, and 20. May be taken as early as the Sophomore year upon completion of prerequisites. (3F, W, Sp) **Alder, Ellsworth**

192. **Historical Synthesis.** Attempts a narrative and topical synthesis of selected great periods and themes in history. Recommended for the Senior year. (2F, W) **Ellsworth**

193. **Introduction to Historical Research.** Directed program of research in primary source materials to illustrate the steps in historical research. Recommended for the Senior year. (3W, Sp) **Staff**

**Graduate Seminars and Colloquia**

**201. Historical Method.** A study of the historical method and its relations to the other social sciences. History 190 and 193 recommended but not required prerequisites. Recommended to graduate students in other fields making use of the historical method in their research. (3F) **Staff**

**203. Historiography.** The history of historical writing. (3W) **Huxford**

**205. Philosophy of History.** Interpretations, causation, and interrelations in history. (3W) **Cazier**

**207. Seminar in American Colonial History.** Guide to the literature and research materials. (3Sp) **Huxford**

**222. Seminar in European History.** Research in primary source materials for the study of special phases of European history. (3F, Sp) **Alder, Hansen**

**223. Colloquium in European History.** Intensive readings and group discussions of literature on selected themes in European history. (3W) **Alder, Hansen**

**224. Seminar in American History.** Research in primary source materials for the study of special phases of American history. (3) **Ahlstrom, Cazier, Huxford**

**225. Colloquium in American History.** Intensive readings and group discussions of literature on selected themes in American history. (3F, Sp) **Ahlstrom, Cazier, Huxford**

**226. Seminar in Western American History.** Research in primary source materials for the study of special phases of Western American history. (3W) **Ellsworth**

**228. Seminar in Latin American History.** Research in primary source materials for the study of special phases of Latin American history. (3) **Pratt**

**229. Colloquium in Latin American History.** Intensive readings and group discussions of literature on selected themes in Latin American history. (3F) **Pratt**

**231. Colloquium in African History.** Intensive readings and group discussions of literature on selected themes in African history. (3Sp) **Lye**

**237. Teaching Utah History.** Seminar in the sources and literature of Utah history, exercises in the preparation and presentation of materials. (3) **Ellsworth**

**239. Readings and Conferences in Special Areas.** Credit arranged. (F, W, Sp) **Staff**

**259. The Teaching of History.** Limited to graduate assistants. (1F, W, Sp) **Staff**

**271. Colloquium on War and Peace.** Intensive reading and discussion of the literature relating to man's attempts to find a means for insuring the peaceful ordering of human affairs. (3W) **Chase**

**298. Thesis.** Credit arranged. (F, W, Sp) **Staff**

**Geography Minor**

The department offers a minor in Geography. The Geography minor consists of 18 credits taken from the curriculum. A Geography teaching minor consists of 26 credits taken from the curriculum. The student minoring in Geography should begin by taking such courses as Geography 30, World Regional Geography, Geography 5, 6, and 7, Cultural Geography of world areas, or Geography 135, Physical Geography. All students preparing to teach in the Social Studies should take Geography 100, Teaching of Geography. It should be taken after the basic courses and before practice teaching. The minor may be filled by taking these and any other upper division Geography courses chosen in consultation with members of the Geography staff.

**Geography Courses**

**1. General Social Science.** A basic general education course giving synthesis of the social science disciplines. (5F, W, Sp) **Peterson**

**5, 6, 7. Cultural Geography. Europe, Afro-Asia, and the Americas.** A survey of geography with emphasis on the social viewpoint. The influence of geography on domestic and international problems: cultural, ethnic and linguistic backgrounds, boundaries, population trends, national economic and governmental systems as they may reflect foreign policy. Students may register for one, two or three quarters. (3F, W, Sp) **Peterson**

**30. World Regional Geography.** A survey of the regions of the earth with emphasis upon the study of the relations of human activities to natural environmental conditions of countries and continents. (5Sp) **Craig**



**100. Teaching of Geography.** A course designed to assist the classroom teacher in the presentation of geographic information. Techniques, methods and sources of data will be stressed. (3F, W, Sp) **Craig**

**105, 106, 107. Geopolitics: Europe, Afro-Asia and the Americas.** A more detailed study of the areas under consideration with special attention directed toward the political and cultural backgrounds of the people. Emphasis will be placed upon the historic development of the regions in light of their position in the modern world picture. (3F, W, Sp) **Peterson**

**130. Geography of Underdeveloped Lands.** A geographic analysis of underdeveloped and emergent countries in terms of internal and external problems and interrelationships. (3) **Staff**

**131. Economic Geography.** The economic interchange and relationships between geographic areas, especially the role of international trade in the world economy. Basic patterns of trade, population distribution, capital equipment and agencies affecting international relations. (3F, W, Sp) **Benson**

**135. Physical Geography of the World.** An approach to geography from the physical

viewpoint with an emphasis on those aspects of the physical environment that are most important to man. Areas covered are weather, climate, landforms, seas, water resources, natural vegetation and associated animal life, soils, mineral fuels, and minerals of economic importance. An analysis is made of the advantages and disadvantages presented by these factors to man's use and potential use of them. (5F, W, Sp) **Craig**

**138. Geography of World War II.** An analysis will be made of the world-wide character of World War II. Attention will be directed to the territorial losses of the Japanese, British, and French colonial holdings and to the emergence of the United States, the Soviet Union, and Red China as world powers. Emphasis will be placed on the new position of the United States as a Pacific power and the war time and post-war commitments of the United States in the picture. (2W) **Peterson**

**180. Urban Geography.** Origin and growth of cities. Structure and function of urban centers, their areal expansion and inter-trade center relations. Theory of the urban setting as related to the rural. (3F) **Craig**

**199. Readings and Conference.** Credit arranged. (F, W, Sp) **Staff**

## Department of

# Political Science

**Head:** Professor M. Judd Harmon  
Office in Main 250

**Professors** Milton C. Abrams, Wendell B. Anderson, Claude J. Burtenshaw; **Professor Emeritus** M. R. Merrill; **Associate Professor** JeDon A. Emenhiser; **Assistant Professors** Robert B. Mollan, Philip S. Spoerry; **Instructor** Calvin W. Hiibner; **Lecturer** H. Preston Thomas.  
**Degrees:** Bachelor of Arts (BA), Bachelor of Science (BS), Master of Arts (MA), Master of Science (MS).

**Majors:** Political Science, Pre-Law.

One of the most important reasons for studying Political Science is to learn the rights and duties of good citizenship. An informed citizenry is essential in a democracy. However, in these days there are a number of career opportunities for those who major in the field. These include teaching in the secondary schools, journal-

ism, and business. There is also a demand for college teachers. The latter requires graduate work usually to the PhD level.

In addition, the Department of Political Science offers career-oriented programs in International Relations, Public Administration, and Pre-Law.

**International Relations**

Unusual career opportunities are available for those possessing the requisite aptitudes and training. The United States Department of State, its Foreign Service, and many other government agencies offer a wide range of opportunities. Private American businesses are expanding foreign operations and international trade. These companies constantly seek qualified personnel. It is recommended that students contemplating an International Relations specialty become proficient in at least one foreign language. Students having a special interest in this area are invited to join the International Relations Club.

**Public Administration**

The career opportunities for persons trained in Public Administration include management positions in city, county, state, national, and international agencies. Administrative positions in finance and personnel are both rewarding and challenging.

**Undergraduate Study****Political Science Major**

Students who major in Political Science should have at least 35 credits in the field. Exceptions are made in certain cases and particularly for those who plan to enter law school. All major students should complete successfully Political Science 10, **American National Government**. Students must have grades of "C" or above in all courses counted toward the major. A 2.5 grade average in the major field is required for graduation. Before being certified for graduation by the department, the student must pass a comprehensive examination in the field. Students will be notified of the time and place of examination.

All students who wish to graduate in Political Science should have a member of the department as an adviser.

**Pre-Law Major**

Utah State University has been very successful in preparing students to enter professional law schools. The success of these students both in the professional training period, and thereafter, indicates the high quality of the preparation.

Some law schools admit only college graduates. Others admit students with less training. College graduation is recommended even though it may not be required for admission.

Those who plan to enter law school should take the Law School Aptitude test several months prior to the time entrance is desired. Many law schools now require that test scores be included in the applications. Applications for the test should be made to Testing Services, Main 29.

Following is a recommended curriculum for Pre-Law students. This has been carefully prepared to conform to the recommendations of the law schools themselves. Some modification is possible. Pre-law students should register with a member of the Political Science staff.

**Recommendations for Pre-Law Majors**

**American Institutions:** PS 10 is required. Optional selections from the following: PS 15, 125, 140, 151, 180, 181, 182, 220, 230, 240, 250, 260. Total minimum credits—12.

**Comparative Government:** Optional selections from the following: PS 70, 170, 171, 172, 173, 174, 175, 176. Total minimum credits—3.

**International Relations:** Optional selections from the following: PS 101, 102, 111. Total minimum credits—3.

**Political Thought:** Optional selections from the following: PS 117, 118, 119, 145, 146, 147. Total minimum credits—7.

**Public Law:** Optional selections from the following: PS 127, 128, 131, 137, 157, 167, 168. Total minimum credits—5.

**Areas of Emphasis in Other Departments.** The lawyer must be familiar with as many areas of human endeavor as possible. It is recommended that the Pre-Law student emphasize the following areas: English, American and European History, Literature, Psychology, Sociology, and Economics. Prospective lawyers should be reasonably skilled in typing and familiar with accounting procedures.

Students contemplating law as a potential career are invited to affiliate with the Pre-Law Club. Professor Wendell B. Anderson is the adviser.

## Graduate Study

**Master of Science and Master of Arts in Political Science.** The program of study for the Master of Science and Master of Arts degree in Political Science is described in the Catalog of the School of Graduate Studies. Students interested in the program should obtain a copy of the Graduate Catalog and must also consult with a member of the Political Science faculty.

## Political Science Courses

1. **Government and the Individual.** Introduces the student to the political world of American democracy. Totalitarian governments and the philosophies of facism and communism that form the theoretical bases of these regimes are also studied. Democracy as practiced in the United States and Great Britain is contrasted with these systems. (5F, W, Sp)  
**Emenhiser, Merrill**
10. **American National Government.** The basic course of the department. It is highly desirable that this be taken before upper division courses in Political Science. (5F, W, Sp)  
**Staff**
15. **American State and Local Government.** Explores the problems of state, county, municipal, and special district governments. (3F, W, Sp)  
**Emenhiser**

50. **Introduction to Political Behavior.** Exploration of politics from behavioral perspective. Special emphasis upon empirically based political theory, concepts, semantics of politics and research procedure. (3W)  
**Hibner**
70. **Comparative Political Systems.** Introduction to the field of comparative government and politics, with emphasis on constitutional and totalitarian regimes, presidential and parliamentary structures, and one-, two-, and multiparty systems. Prerequisite: PS 10 or departmental permission. (3F)  
**Sperry**
75. **War-Peace Colloquium.** A course designed to investigate into the various causes of war and conditions for peace: an interdisciplinary inquiry. (3F, W, Sp)  
**Abrams**
- 91, 92, 93. **Public Affairs Series.** Those assemblies, forums and other campus events relating to public and international affairs are included in the series. Students will be expected to attend and report and evaluate six scheduled events. Passing rather than letter grades will be given. Series conducted in cooperation with Associated Students. (½F, ½W, ½Sp)  
**Anderson**
101. **American Foreign Policy.** The place of the United States in the world of nations as affected by our traditions, interests, and interpretations of international affairs. (3F)  
**Merrill**
102. **International Political Relations.** Psychological, economic, racial and other obstacles to international cooperation, as exemplified in recent events. Attention is given to various proposals that attempt to solve the dilemmas of our time. (3W)  
**Merrill**
110. **Basic Problems in International Relations.** Examines current international developments with emphasis on their relation to the United States. (3Sp)  
**Merrill**
111. **International Government.** The purposes, organization and operation of the United Nations and the Atlantic Community are studied. (3Sp)  
**Anderson**
114. **Intergovernmental Relations.** Studies the relations between and among the various units of government in the United States including national, state, county, city and district. (3Sp)  
**Emenhiser**
115. **Problems of Utah Government.** Examines contemporary problems of Utah at the state, county, and city level, as well as federal-state and interstate relations. (3W)  
**Emenhiser**
- 117, 118, 119. **American Political Thought.** A survey of American political ideas and the men who developed them. The historical approach is used, beginning in colonial times and carrying the development of American political thought through to the present.

## 100 College of Business and Social Sciences

Emphasis is on ideas that have been significant in shaping the form and actions of American government today. Student may register for one, two, or three quarters. (2F, 2W, 2Sp) **Harmon**

**123. Political Surveys.** Introduces the student to the tools of political field research and stresses the analysis of voting behavior by utilizing census data, election returns, and questionnaires. (3W) **Emenhiser**

**124. Public Opinion and Policy Formulation.** A discussion of the nature of public opinion and propaganda and their role in the political process. Assigned research topics on particular current policy developments assist the student in attempting to determine the effects of public opinion upon governmental policy decisions. (5Sp) **Emenhiser**

**125. Political Parties and Practical Politics.** Organization and practices of political parties and pressure groups. (5W) **Emenhiser**

**126. Polimetrics.** Presents basic social statistical tests and other mathematical devices applicable to explaining quantitative political data. (3Sp) **Emenhiser**

**127. Constitutional Law.** The first part of a two-part foundation course in American constitutional law. The case method is used extensively. Prerequisite: PS 10. (3F, 3Sp) **Mollan**

**128. International Law.** A basic course in the law of nations. Students should have had at least one course in international relations or foreign policy. (5W) **Anderson**

**131. Administrative Law.** Constitutional limitations, legislative supervision, and judicial control of administrative agencies, and the forms of administrative action appropriate for American economic and political institutions. (3Sp) **Hiibner**

**137. Constitutional Law.** The second part of a two-part foundation course in American constitutional law. The case method is used extensively. Prerequisite: PS 127. (3W, 3Sp) **Mollan**

**140. American Legislative Process.** Includes a study of the organization and procedure of legislative bodies and the influences at work in and the character of the output of national and state legislatures. (5W) **Emenhiser**

**145, 146, 147. History of Political Thought.** Course 145 covers political thought from its beginnings in the Greek period to the Reformation. Course 146 carries on the study of Hegel. Course 147 is devoted to the modern period and emphasizes a comparative study of socialist, communist, nazi-fascist, and democratic thought. (3F, 3W, 3Sp) **Harmon**

**151. Introduction to Public Administration.** Defines the subject matter of public administration, concentrates upon analyzing the problems of governmental administrative organization and management, and explores the methods of securing responsible performance from the bureaucracy. (3F) **Hiibner**

**152. Public Personnel Administration.** Reviews the trends and techniques of recruiting and developing the public service and calls attention to the machinery established for these purposes. Prerequisite: PS 151. (3W) **Hiibner**

**153. Public Finance Administration.** Describes national, state, and local governmental budgetary and accountability processes in relation to policy formulation. Prerequisite: PS 151. (3Sp) **Hiibner**

**154. Public Administration Internship.** Offers the student the opportunity to observe and, within limits, practice what he has learned from his classroom experience. The student will be placed in a nearby governmental office where he will be expected to spend the equivalent of one day per week performing administrative tasks or conducting an administrative survey. Prerequisites: PS 151, 152, and 153. (2F, 2W, 2Sp) **Hiibner**

**157. Civil Rights Law.** The law as it relates to civil liberties. State and federal action in this area. The emphasis is on Supreme Court decisions and their implementation. (3Sp) **Mollan**

**159. Ethics of Society and Law.** This course deals with the problems of knowing, free will, sources of morality, and the morality of law. (3F) **Burtenshaw**

**160. Theory and Practice of Government.** Designed to satisfy the demand for an offering in general government on the upper division level for non-political science majors, particularly those in education, forestry and the exact sciences. The course will deal with the important theories underlying the various governmental forms and with the practical operation of government. The emphasis will be on the national government of the United States. (3F, W, Sp) **Staff**

**167. The American Legal System.** A study of the organization and operation of the American federal and state legal systems. (3F) **Thomas**

**168. Theory of Jurisprudence.** An examination of the important legal philosophies from Aristotle to the present with particular emphasis on the Anglo-American legal system. (3W) **Thomas**

**170. Major Governments of Europe.** A comparative study of the governments of Great Britain, France, Germany and the Soviet Union. (3F) **Anderson**

171. **Major Governments of Asia.** Principal attention will be given to the governments of Japan and China. (5W) **Spoerry**

172. **Major Governments of Latin America.** A comparative study of the governments of Argentina, Brazil, Mexico and other selected Latin American countries. **Pratt**

173. **Soviet Government and Politics.** Designed to present the structure and functioning of the Soviet government and Communist party. Attention is given to the theoretical background of Communist government and party practices in modern times. (3F, Sp) **Spoerry**

174. **Politics of the Communist Bloc.** Relations between Communist and Soviet bloc governments, including the USSR, Communist China, and Eastern Europe. (3Sp) **Spoerry**

175. **Political Systems in South and Southeast Asia.** Politics and government in India, Indonesia, Burma, Philippines, and other countries in the area. (3W) **Spoerry**

176. **Politics of Underdeveloped Areas.** Characteristics and problems of the political systems of the non-Western world, including Asia, Africa, and the Middle East. (3W) **Spoerry**

177. **Today's Critical Latin American Problems.** Topics will vary as crises develop, dealing with background and development of each crisis from national, political, economic, or social views. (2F) **Pratt**

180, 181, 182. **Current Political Problems.** Any quarter may be taken without the preceding quarter or quarters. Lower division students must receive consent of the instructor. (2F, 2W, 2Sp) **Merrill**

190. **Problems in American National Government.** The student enrolling in this course should have some basic knowledge of the structure of the American national government. Political Science 190 will consider the government in operation and some of the problems which grow out of that operation. Particular emphasis is on the relations between the three branches of government. (3Su) **Staff**

195. **Library Resources of Political Science.** Devoted to familiarizing students with the basic library materials available. The various types of resources are carefully studied and used by each student. (1F) **Staff**

## Graduate Courses

201. **Research in Political Science.** Credit arranged. (F, W, Sp) **Staff**

203. **Readings and Conference.** Credit arranged. (F, W, Sp) **Staff**

205. **Methods in Political Science.** Methods the political scientist must use that are common to all sciences, the particular problems with which the social scientist is confronted, and their application to special problems of political science. (3) **Staff**

211. **Thesis.** For graduate students preparing a Master's degree thesis. Credit arranged. (F, W, Sp) **Staff**

220. **Seminar in Comparative Politics.** A seminar designed to give graduate students and qualified seniors a more detailed and deeper knowledge of comparative political systems. (3W) **Spoerry**

230. **Seminars in Public Law.** A seminar designed to give graduate students and qualified seniors a more detailed and deeper knowledge of public law, especially constitutional law. (3F) **Mollan, Thomas**

240. **Seminar in American Politics.** A seminar designed to give graduate students and qualified seniors a more detailed and deeper knowledge of American politics. (3W) **Emenhiser, Harmon**

250. **Seminar in Political Theory.** A seminar designed to give graduate students and qualified seniors a more detailed and deeper knowledge of political theory, both American and European. (3F) **Harmon**

260. **Seminar in Public Administration.** A seminar designed to give graduate students and qualified seniors a more detailed and deeper knowledge of public administration. (3Sp) **Hiibner**

270. **Seminar in Foreign Affairs.** A seminar designed to give graduate students and qualified Seniors a more detailed and deeper knowledge of foreign affairs, including American foreign policy, international relations, and international organizations. (3Sp) **Anderson, Merrill**



Department of

## Sociology, Social Work, and Anthropology'

**Head:** Professor Theler R. Black  
Office in Main 220

**Professors** Wade H. Andrews, Stephen L. Brower, William R. Compton, R. Welling Roskelley; **Associate Professors** H. Bruce Bylund, William A. DeHart, Gordon N. Keller, Evelyn Hodges Lewis, Armand L. Mauss, John A. Pennock; **Associate Professor Emeritus** Carmen D. Fredrickson; **Assistant Professors** Yun Kim, Nile D. Meservy, Alice Colton Smith, Berkley A. Spencer; **Instructor** Kathryn A. Sikorski; **Lecturer** Alison Thorne.

**Degrees:** Bachelor of Arts (BA), Bachelor of Science (BS), Master of Arts (MA), Master of Science (MS), Doctor of Philosophy (PhD).

**Majors:** Sociology, Social Work.

Study of Sociology, Social Work, and Anthropology contributes to students in two important ways. First, it provides a broad and general perspective about man. This perspective is developed through examination of the general features of the cultural and social life of man in complex civilization, and of man in prehistoric, primitive, and less technologically developed societies. This approach leads to better understanding of the processes and principles of social life that are alike and that are different from one part of mankind to another. This helps the student see himself, his groups, and his society in a meaningful relationship to others.

Secondly, study in these fields prepares the student for varied occupations in teaching, social welfare, administration, and research.

Teaching positions are largely at the junior high and high school levels, and, with more advanced training, on the college level. Teaching positions in the public schools are usually integrated with history; thus, a strong minor

in history is encouraged for those who seek teaching positions.

Social welfare positions, both public and private, are widely available. These positions are variously referred to as case worker, group worker, probation and parole officer, child welfare worker, psychiatric case aide, employment officers, etc. Those whose training is in social work, or in sociology with a social welfare emphasis, have significant opportunities here.

Administration, particularly when associated with fields where management of people is crucial, has many and varied openings for persons with training in Sociology, Social Work and Anthropology. The human and organizational aspect of administration is extremely vital, and persons trained in subjects that provide knowledge and understanding in these areas are in demand.

Research is another occupational outlet. Opportunities to do research exist in industry, government, private and public agencies, and in educational organizations. These positions usually require some grad-

uate training. Because of the need for qualified research people in Sociology and Anthropology, graduate schools compete heavily with scholarships, assistantships, and fellowships to attract students with training in these fields.

## **Sociology Major**

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).

2) Complete a minimum of 47 credits within the department. A maximum of 60 credits within the department is allowed. This is inclusive of any department course used in filling University group requirements.

3) Complete 18 credits in a minor field outside of the department.

4) Complete the following specific courses: Soc 70 or Soc 10; Anthro 90; Soc 140; Soc 153; Soc 154; Soc 161, or Soc 199; Soc 170; Soc 186; Soc Work 173.

5) Complete at least one of the following courses: Soc 100, Soc 141, Soc 156, Soc 184, Soc 187, Soc 188, Soc 195.

6) Complete at least two credits of Seminar from the following: Soc 110, Soc 190; Soc 191, Soc 192.

7) Also, students expecting to do graduate work should take Applied Statistics 121 or Psy 112.

8) Soc 70 or 10, or Anthro 90, is prerequisite to upper division courses in the department.

Sociology majors who will seek positions with social welfare and correctional agencies should develop a reasonable concentration of Social

Work and other courses in the social welfare area. Similarly, with the help of advisers, students who will seek positions in other special areas should include appropriately related courses.

## **Minor**

Students minoring in Sociology must meet the University minimum of 18 credits. These should be distributed widely among the Sociology instructors and should be selected with the aid of one of the Sociology instructors.

## **Graduate Study**

The department offers courses leading to the Master of Science, Master of Arts, and Doctor of Philosophy degrees in Sociology. Instruction is comprehensive since it covers the general areas of sociological theory, methodology, social organization, social disorganization, social psychology, and cultural anthropology. Instruction is specialized in area-community studies, institutional development, and rural sociology (domestic and foreign); sociology of social welfare and corrections; sociology of natural resources; social-psychological elements in motivation and consumer behavior; demography; and other areas closely associated with staff and graduate research programs. Research is promoted through departmental relationship with the Agricultural Experiment Station, with the Division of University Research, with state and federal agencies, and with private organizations.

### **Doctor of Philosophy Degree.**

This degree is offered in Sociology through collaboration with closely related departments.

Requirements for the PhD degrees are explained in the Graduate School section of this bulletin.

Also see Catalog, School of Graduate Studies. Further details are in a department bulletin for graduate students available upon request from the department secretary.

Graduate assistantships are available. Applications can be obtained in the Graduate School or in the Department.

## Sociology Courses

Sociology 70 or 10, or Anthropology 90, or instructor's permission (if you are a graduate student), is prerequisite to all courses numbered 100 or above.

**5. American Culture.** Basic beliefs, values, customs, and institutions of America. Problems of cultural lag. New knowledge, based upon a changing culture that should redirect institutional life to meet the changing needs of the people. (3) **Roskelley**

**10. Rural Sociology.** The influence of geography upon rural culture. Patterns of settlement and their influence upon rural life. Population growth and migratory patterns of rural people. Conflict, cooperation and other interaction processes. Rural institutions and adjustments to meet rural problems. Credit not given if Soc 70 has been taken. (5F, W, Sp) **Staff**

**70. Introductory Sociology.** How does biological man become human? The way men of different cultures control their societies and evaluate their behavior. How and why men organize as they do to express their love, hate, and fears or acquire money, education, or security. Credit not given if Soc 10 has been taken. (5F, W, Sp) **Staff**

**75. Effective Community Living.** Understanding the community we live in. Practical experience in learning fundamental tools for social action by individuals, organizations and groups. (3) **Staff**

**100. Educational Sociology.** Social and cultural factors within the school system, and between the school system, the home, and the community. (3) **Black, Mauss**

**110. Utah Social Problems Seminar.** Analysis and field study of Utah social problems. Must be taken two quarters. (1F, W, Sp) **DeHart**

**140. Social Psychology.** The cultural and social determinants of personality growth. The application of such knowledge to the understanding of group process, mass behavior and the human relations problems that characterize our society. (3F, W) **DeHart**

**141. Rural Community Organization and Leadership.** Forces and procedures which are effective in organizing or disorganizing communities. Techniques of training leaders to help make the community more effective. (3F, W) **Roskelley, Thorne**

**144. Woman Today.** The new and challenging roles of women in adjusting to a modern society. (3) **Staff**

**145. Alcoholism.** See Health, Physical Education and Recreation 145. (3) **Nelson**

**153. History of Social Thought.** Development of social thought from early periods to Auguste Comte. Important developments in Europe and America after Comte, especially early American thought. (5F) **Roskelley**

**154. Population Problems.** Population theory, growth and changing pattern of the population. The significance of these population changes on today's living and planning for the future. (3F, W) **Kim**

**155. World Population Problems.** Current and future population problems, particularly in less developed areas of the world. Factors affecting population growth and change. (3W, Sp) **Kim**

**156. Social Institutions.** Similarities and differences in institutions as they emerge, grow and decline. Problems of keeping institutional objectives attuned to the fulfillment of the needs of an evolving social order. (3) **DeHart**

**158. Human Relations in Industry.** Human relations, philosophy and skills applicable to present-day management practices. The contribution of social science in building a human relations program in industry. (3F) **DeHart**

**159. Industrial Sociology.** Stresses contribution of sociology to the understanding of industry as a social system. Includes work behavior of individuals and consideration of the impact of technological change on the community and larger society. (3F, Sp) **DeHart**

**161. Modern Social Problems.** Major American social problems. Adjustments and changes as means of minimizing disorganization. (3W, Sp) **Lewis**

**170. Intermediate Sociology.** Basic principles of sociology are considered in their theoretical and methodological settings, as a body of facts, a method of investigation and an explanation of associative living. (5) **Black**

**171. Juvenile Delinquency.** Heredity, environmental, cultural and social conditions which are causative factors in delinquency. (3F) **Pennock**

**172. Delinquency Prevention.** Modern philosophies about behavioral characteristics of children. Community and organizational programs of delinquency prevention. (3Sp) **Pennock**

**174. Criminology.** Extent and nature of crime, and various factors related to criminal behavior. Theories of crime causation. Methods of law enforcement. (3W, Sp) **Pennock**

**180. Group Dynamics.** Group processes from the point of view of improving individual groups. Social action as a group process. (3W) **DeHart**

**184. Social Change.** A systematic analysis of selected theories of social change with emphasis on the social psychological approach leading to an understanding of the change process and alternative strategies for effecting change. (3W) **Bylund**

**186. Methods of Social Research.** Historical development of social research. Methods and techniques of analyzing and interpreting social data. (3F, W) **Kim**

**187. Sociology of Natural Resources.** Designed for upper division and graduate students interested in the social organization and social systems associated with natural resources. In addition to a study of principles, it will include a field study of resource problems. (3F) **Andrews**

**188. Sociology of Leisure.** A study of the theory of leisure, in terms of function and organizational structure in rural and urban America. Outdoor recreation associated with natural resources and social factors affecting leisure are among the subjects to be included. (3W) **Andrews**

**190. Seminar in Sociology.** Selected sociological concepts or problems. (1F, W, Sp) **Staff**

**191. Legal Obligations in Husband-Wife Relations.** The legal approach to the validity of marriage, the obligations imposed by the law upon husband and wife and the legal remedies in problems of marital discord. Legal history and precedents and the responses and lack of responses of the courts to current social trends. (2F, W) **Compton**

**192. Legal Obligations in Parent-Child Relations.** The determination of illegitimacy, custody and adoption, and the legal rights and duties flowing therefrom. Other rights and legal obligations of parent and child. Prerequisite: Soc 191. (2Sp) **Compton**

**195. Urban Sociology.** The changing nature of American life as it has moved from predominantly rural to urban patterns. Significant events that have led to urbanization. Guidelines that are useful for thinking about the urban world of tomorrow. (3) **Kim, Pennock**

**196. Race Relations.** Historical perspective of minority group relations as they have existed in the United States and other parts of the world. Critical examination of the implica-

tions which these relations have for social life in the United States. Analysis of current aspects of integration vs. segregation as they affect individuals and groups in our present-day society. (3F) **Pennock**

**199. Social Disorganization.** A study of social problems from the standpoint of the social processes that bring them about; the genesis of antisocial attitudes in the individual, the family and the community; and of the conflict between these attitudes and those held by the larger defined group. (3F) **Meservy, Pennock**

**201. Research in Sociology.** A project for original study is organized and field work is carried out under supervision. Prerequisite: Soc 186. Credit arranged. See Thesis adviser. (F, W, Sp) **Staff**

**202. Advanced Sociological Theory.** Critical analysis of current sociological theory about human society. Prerequisite: Soc 170 or permission of instructor. (5W) **Black**

**203. Independent Readings in Sociology.** Reading and conferences on topics selected by the student and the adviser. Credit arranged. Instructor's permission required. (F, W, Sp) **Staff**

**207. Graduate Seminar.** Short subjects within the field of Sociology pertinent to but not available in regular courses. Instructor's permission required. (2F, W, Sp) **Staff**

**210. Advanced Rural Sociology.** Analysis of major developments in rural social thought; research and application aimed at solution of rural social problems throughout the world. (3) **Roskelley**

**225. Sociology of Deviant Behavior.** Deviant behavior may be antisocial and not criminal or criminal and not antisocial. Research in depth to give the student greater insight and perspective into the social implications implicit within this concept. (3W) **Pennock**

**245. Sociology of Consumer Behavior.** An analysis of consumer behavior theories and research techniques with emphasis on the social psychological approach. (3F) **Bylund**

**286. Survey Research.** The student will be exposed to the various techniques available for obtaining data through survey research including both structured and unstructured questions. Focus will be upon 1) interview schedules and questionnaire development and construction, 2) interviewing and questionnaire techniques, 3) organizing data for analysis. (3W) **Bylund**

**288. Practicum in Sociological Research.** Supervised application of sociological research in field studies. Credit arranged. (F, W, Sp) **Staff**

**289. Methods of Population Analysis.** Use of rates, ratios, life tables, and related indices in analyzing, estimating, and projecting population in geographic areas. School, welfare, and labor force populations also will be considered. (3W) **Kim**

**290. Methods of Population Analysis.** (3Sp) **Kim**

**301. Research and Dissertation.** The dissertation project is to be selected, organized, and carried out under supervision. Credit arranged. See dissertation adviser. (F, W, Sp) **Staff**

**303. Advanced Independent Readings in Sociology.** Readings and conferences at the PhD level, selected by the student in consultation with, and by permission of, the instructor. Credit arranged. (F, W, Sp) **Staff**

**307. Advanced Graduate Seminar.** Special subjects at the PhD level within the field of sociology, pertinent to, but not available in regular courses. Instructor's permission required. (2F, W, Sp) **Staff**

## Social Work

The demand for qualified social workers far exceeds the supply. The opportunity in Social Work is steadily growing, not only because the mounting complexities of modern life bring about an increasing number of personal difficulties, but because methods of constructively dealing with these difficulties are becoming more fully known. In addition, many new services requiring social workers are being developed. As the professional content of positions in Social Work has become clearer, added emphasis has been given to adequate education and training.

With the establishment of the Council on Social Work Education in 1952, the graduate schools and undergraduate departments of Social Work joined forces with other segments of the profession to provide more effective recruitment and training of a larger number of persons for the expanding positions in Social Work. Undergraduate education in Social Work is not regarded as a substitute for graduate training, but as excellent preparation for employment in those positions for which

graduate training is not required, as well as excellent preparation for graduate study in Social Work. More than 100 undergraduate departments of Social Work have been approved for constituent membership in the Council on Social Work Education, of which this Department is a charter member.

## Social Work Major

Social Work 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 47 credits in Social Work, Sociology, Psychology, Economics, and Political Science. A maximum of 60 credits **within the Department** of Sociology, Social Work, and Anthropology is allowed. This is inclusive of any department course used in filling University group or other requirements.

3) Complete 18 credits in a minor field.

4) Complete the following specific courses: SW 173; SW 174 or SW 191; SW 175a; Soc 186; Psy 100 or FCD 100; SW 199 or Econ 127; PS 151; Anthr 165.

5) Complete 9 credits from the following: SW 162; SW 170; SW 175b; SW 175c; SW 177; SW 195; SW 197; SW 198. SW 174, 191, and/or 199 may be included as part of the 9 credits if not selected above.

6) Complete 9 credits from the following: Soc 100; Soc 140; Soc 141; Soc 144; Soc 153; Soc 154; Soc 158; Soc 159; Soc 161; Soc 170; Soc 171; Soc 174; Soc 180; Soc 184; Soc 188; Soc 191; Soc 192; Soc 195; Soc 196; Soc 199.



7) Complete 3 credits from the following: Anthr 162; Anthr 166.

8) Complete 3 credits from the following: Psy 123; Psy 140; Psy 202; Psy 205; Psy 221.

9) SW 173 is a prerequisite to SW 174 and SW 191, and must be taken prior to or concurrently with SW 175a, preferably in the Junior year.

10) Soc 70 or Anthr 90 is a prerequisite to all upper division Social Work courses.

## Minor

Students minoring in Social Work must meet the University minimum of 18 credits, and should plan their courses with the aid of one of the Social Work instructors.

## Social Work Courses

50. **Social Welfare Agencies.** Agencies and institutions which provide social services such as child welfare, family casework, school social work, and public assistance. (3F, W) **Meservy**

60. **Social Welfare Philosophy.** Social welfare as a part of social structure. Special attention to be given to society's concern for persons and groups with special needs. (3W) **Lewis**

162. **Mental Health.** The prevention and treatment of mental illness and the maintenance of mental health in modern society. This course or its equivalent should be taken by all social work majors. (3F, W) **Meservy**

170. **Child Welfare.** Evolution and current developments in programs for meeting needs of children: substitute parental care and adoptions, child labor laws, juvenile courts, provisions for unmarried parents, the handicapped child and the exceptional child. (3F, W) **Lewis**

172. **Delinquency Prevention.** (See Sociology 172) (3Sp) **Pennock**

173. **The Field of Social Work.** Social casework, social group work, and community organization. Objectives, processes, and personnel work. Prerequisite to SW 174 and SW 191, and must be taken prior to or concurrently with SW 175a, preferably in the Junior year. (3F, W) **Meservy**

174. **Introduction to Case Work.** Theories and practices of social casework, with emphasis on problems and techniques of interviewing. Prerequisite: SW 173. (3F, W) **Meservy**

175a. **Introduction to Field Work.** Various agencies dealing with social work and related areas. Includes field trips. (Taken concurrently or immediately following SW 173.) (2F, W) **Meservy**

175b and c. Continuation of above for Seniors. (2F, W) **Meservy**

177. **Treatment of Children with Problems.** Analysis and treatment of problems of children with special needs. (3Sp) **Lewis, Meservy**

178. **Adolescence.** Social adjustment of the adolescent as influenced by the nature of the culture in which he lives. Methods of working with adolescents. (3) **Staff**

180. **Group Dynamics.** See Soc 180. **DeHart**

191. **Social Work Methods.** Basic concepts and methods used in casework, group work, community organization, social planning, and administration of social welfare agencies. (3F) **Lewis**

195. **Social Work Seminar I.** Social Work publications and other source materials applicable to the field. (1F, W, Sp) **Lewis, Meservy**

197. **Service to the Aged.** Description and discussion of trends and development of agencies and services for the aged. (3Sp) **Meservy**

198. **Corrections.** Historical perspective of crime and punishment as contrasted with modern concept of penology which looks at the penitentiary as an institution of rehabilitation and resocialization of the juvenile and adult offender. (3) **Pennock**

199. **Public Welfare.** Examination and evaluation of public and private welfare programs including the program of the Department of Health, Education and Welfare as it applies to unemployment, old age assistance, aid to needy children, and physically or mentally handicapped. (3Sp) **Meservy, Pennock**

203. **Independent Readings in Social Work.** Credit arranged. Instructor's permission required. (F, W, Sp) **Staff**

## Anthropology

Anthropology offers the widest possible framework for the understanding of man and society through courses dealing with the present diversity of cultural and human types as well as prehistoric evolutionary perspectives. The study of Anthropology provides a useful background for students in the social sciences, humanities, biological sciences, and education. It leads, when pursued through

graduate levels, to careers in research, teaching, and some branches of government service.

### Minor

Students outside of the department may minor in Anthropology. The University minimum of 18 credits is required and should be selected with the aid of one of the Anthropology instructors.

### Anthropology Courses

**90. Introduction to Cultural Anthropology.** Nature and evolution of man and his social and cultural behavior. Using empirical data from prehistoric, primitive and contemporary cultures, current ideas and generalizations about human behavior are explored.

(5F, W, Sp)

**Keller, Sikorski**

**92. Peoples and Cultures of the World.** Intensive comparison of the economic, political, kinship and religious structures of representative societies from the major culture areas of the world. (3F, Sp)

**Keller**

**95. Human Prehistory.** Evidence discovered through research of man's existence upon the earth before the period of written history. (3F, W)

**Sikorski**

**105. Comparative Value Systems and Education.** Theoretical and illustrative contributions of anthropology to a broad perspective on the variability of the educational processes and objectives in various primitive and complex societies over the world. (3W, Sp)

**Keller, Sikorski**

**160. Comparative Family Systems.** Basic anthropological concepts and theories relating

social structure based on kinship, its analysis, evolution, functions, change, and variability over the world. (3F)

**Keller**

**162. Religion, Society, and the Individual.** Anthropological analysis of religion as a cultural phenomenon and its functional relationships to society and the individual.

(3W)

**Keller**

**163. Peoples—Mesoamerica.** An ethnological survey of cultures in Mexico, Guatemala, and other Mesoamerican countries in various degrees of cultural progress and acculturation. (3W)

**Sikorski**

**165. Culture and Personality.** The processes of personality development in terms of culture and social class. The nature and interpretation of personal experiences in different cultures. (3F, Sp)

**Keller, Roskelley**

**166. American Indian Ethnology.** Economic, political, kinship, and religious structures of representative aboriginal cultures of the main culture areas of the North American Indian. Emphasis will be given to prehistoric peoples of the local Great Basin area. (3W, Sp)

**Keller, Sikorski**

**167. North American Prehistory.** Analysis of man and cultural evolution in the major cultural areas of prehistoric America. Includes archeological laboratory and field methods with investigations of local sites. (3Sp)

**Keller, Sikorski**

**268. Independent Studies in Anthropology.** Advanced readings or projects relating to theory, field or laboratory studies arranged by student and staff. Instructor's permission required. Credit arranged. (F, W, Sp)

**Staff**

**269. Psychological Anthropology.** A comparative analysis of psychiatric disorders and behavior disturbances with social categories in western society and various societies of the world. (3Sp)

**Keller**

### Division of

## Military Science and Aerospace Studies

Dr. Edwin L. Peterson, University ROTC Coordinator

Colonel Owen W. Owens, Professor of Military Science

Lt. Col. Roland H. Taylor, Professor of Aerospace Studies

Each male citizen of this country has a moral obligation to serve in the military forces when required for the defense of his nation. The Reserve Officers' Training Corps program is one of

several ways by which this obligation can be fulfilled. Through the ROTC program, America offers outstanding college men a pathway from campus leadership to important command responsibilities.

ties as officers with the Active or Reserve Military forces.

Two separate ROTC units are located at USU: Army and Air Force. Men may initially choose which program they wish to enter; however, subsequent transfer between units is not generally approved because of the difference in curriculum.

Army and Air Force ROTC consist of a two- and a four-year program. Four-year programs consist of a Basic Course and Advanced Course. The Basic Course is normally taken during the Freshman and Sophomore years. It consists of six quarters of work, including a Leadership Laboratory. The advanced course is normally taken during the Junior and Senior years and consists of six quarters of work plus a summer camp (between the Junior and Senior years).

The Army and the Air Force ROTC two-year programs are designed for students who transfer to USU from other institutions where ROTC was not offered, or for those students who were unable to take the basic course because of scheduling difficulties.

Students who elect the two-year program will be required to attend a six weeks' summer camp before enrolling in the Army or Air Force Advanced Course. Applications for the two-year program must be made in advance due to the summer camp and administrative requirements. A student wishing to begin classwork in September must submit his application during the previous November.

The advanced course is both elective and selective. Once entered upon, completion of the Advanced Course becomes a requirement for graduation unless a proper release is obtained. Qualified students are selected for

enrollment in the Advanced Course by boards composed of military and civilian faculty members. Selection by the boards is based on leadership ability, academic standing, officer potential, and interest in the military. Satisfactory completion of the Basic Course or basic summer camp is a prerequisite for entrance into the Advanced Course unless constructive credit is granted for previous active military service.

Satisfactory completion of either basic camp or a basic summer camp of at least six weeks duration or the Basic Course and Advanced Courses, including the summer camp, leads to a commission as a Second Lieutenant in the Army or Air Force Reserve. Outstanding students in both programs are designated Distinguished Military Students and are afforded the opportunity of applying for commissions in the regular service.

Deferment from the draft is offered to selected students who maintain satisfactory grades in ROTC. Upon completing the program and being commissioned, students normally enter on active duty with the armed forces as a Second Lieutenant in the service in which they are commissioned. The period of active service required of ROTC graduates depends on the requirements of the service concerned.

**Enrollment Regulations.** ROTC leadership, drill and command periods are an integral part of the ROTC program. Registration for one of these periods is required of all ROTC students.

An activity fee of \$5 is required of all ROTC students and is paid at the time of initial enrollment each year. This fee is not refundable after withdrawal date for any school quarter.

## General Requirements

### A) Basic Course:

1) Be a citizen of the United States.

2) Not less than 14 years of age.

### B) Two-Year Program

1) Attend and complete a six-week basic military summer camp.

2) Have two academic years remaining after completion of basic summer camp.

### C) Advanced Course:

1) Satisfactorily complete the basic course or have equivalent credit.

2) Accept and sign a draft deferment agreement and agree to stipulations of the Advanced Course contract, outlining the obligations of both the student and the service.

3) Have high moral character.

4) Obtain a satisfactory score on the Army or Air Force Qualification Test.

5) Be selected for enrollment into the Advanced Course by a selection board composed of officers and civilian faculty members. Selection is based on academic standing, previous ROTC grades, scores in the tests, moral character, leadership, and officer potential.

6) Meet status requirement. It is desirable, but not required, that a student complete the ROTC program and the requirements for a degree simultaneously. For selection into the Army Advanced Course, a student must have at least two years of college remaining before becoming eligible for a Bachelor's degree. For selection into the Air Force Advanced Course, a student must have at least two years of college remaining in either undergraduate and/or graduate status.

7) Enlist in a reserve component for a period required by the Secretary of the service concerned. (The student is not required to become a member of a local unit nor attend weekly drills.)

## Department of

# Aerospace Studies

**Head: Professor** Lt. Col. Roland H. Taylor  
Office in Military Science 107

**Assistant Professors** Capt. Roscoe H. Burgoyne, Capt. Richard W. Shriber, Capt. H. L. Miller.

The purpose of Air Force ROTC is to provide education that will develop skills and attitudes vital to the career of a professional Air Force Officer; to find and interest capable young college men to apply for Air Force Officer training; to screen and select them in desired numbers and categories to meet Air Force needs; and to perform these func-

tions in a way to motivate these men to enter the military profession on a career commitment. It is not the purpose of the course to train in a specific field, but rather to give an understanding of the mission and the global responsibilities of the United States Air Force. The academic phase develops a background in national and inter-

national affairs to help interpret and evaluate world events.

The AFROTC teaching methodology is based on the seminar and independent study methods of the graduate school. Professional officer preparation is achieved by active participation of the cadet in a learning situation which parallels, in many respects, the activities of an Air Force officer, through discussion, conference, and coordination actions leading to decision making. The curriculum has been designed to meet the following criteria: college-level content, scope, intensity and presentation; appeal to students in all academic fields; and preparation to undertake flying training upon graduation.

### **The Two-Year Program**

Screening of candidates for the two-year program will conform to the same requirements for selecting advanced students in the four-year program. Prior to formal enrollment each student must be eligible and successfully complete six weeks of field training. The course of instruction is the same required of the four-year program with the basic program covered in the six weeks of field training.

### **The Four-Year Program**

Study is divided into the General Military Course (GMC), covering the first two years, and the Professional Officer Course (POC), covering the Junior and Senior years plus four weeks of summer training. The course consists of instruction totaling 360 hours, allocated as follows: Freshman and Sophomore - 60 each; Junior and Senior years - 120 hours each. Summer training of four weeks is scheduled between the third and fourth years.

OE 100, the Freshman course, explores the causes of present world

conflict as they affect the security of the United States. The Sophomore course, OE 200, is a comparative study of world military forces. These two courses constitute the General Military Course.

In the Junior year, OE 300 deals with the development of air power, astronautics and space operations, and future developments in Aerospace power. The Senior course, OE 400, provides a study of professionalism, leadership and management. The focus of the Advanced Course is on the mission environment and personal identification of the cadet with his career.

In addition, the curriculum includes: experiences designed to stimulate and develop a growing interest in Air Force flight training program (e. g., orientation flights and visits to Air Force Bases); opportunities to apply the principles of leadership, management and staff work in practical situations, and other related experiences.

### **Physical Requirements**

All cadets must meet the physical standards for general military service. A cadet's physical examination for entry into the University will generally determine whether or not he meets these requirements.

### **Veterans**

A veteran is accepted into the AFROTC program if he can complete the program prior to reaching age 30, provided he has completed at least two years active duty and can meet the physical requirements. Parts of the General Military Course may be waived in lieu of prior military service. If accepted he can participate in the flight indoctrination program in the Senior year, provided he will be commissioned before age 26½ years.



### **Special University and AFROTC Requirements**

Once a student enters the Professional Officer Course, successful completion of the course becomes a requirement for graduation, unless relieved of the requirement by the Professor of Aerospace Studies or the President of the University. In addition, when entering the Professional Officer Course, 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, Aerospace classes should be scheduled to be completed simultaneously with requirements for a degree. If the student is an engineer under a five-year program, he should plan his Aerospace program in advance with his adviser and the AFROTC Department in order to meet the above requirements.

To qualify as a pilot or navigator, cadets must be able to finish the Aerospace program and graduate from the University before age 26½ years. Other cadets must complete the military program and graduate from the University prior to reaching the age of 28, unless they are veterans.

**Regular Commissions in the United States Air Force.** Outstanding AFROTC Cadets who have demonstrated a high degree of leadership, initiative, and an interest in a career as a regular officer and are designated a Distinguished Military Graduate may be offered an opportunity to apply for a regular Air Force Commission.

**Payments to Advanced Cadets.** The advanced cadet is paid a retainer fee of \$50 per month. Cadets will be paid approximately \$140 for the Field Training Course plus travel pay for the round trips to and from camp.

### **Summer Training**

a) Field Training Course (6 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.

b) Field Training Course (4 weeks). All advanced cadets will attend one summer training camp of four weeks in duration. Normally, attendance at this camp is between the Junior and Senior years at a selected Air Force Base. Six university credits are granted for this training.

**Flight Training.** AFROTC is concerned with two types of flight training; the first type is taken while a student is a cadet at the University and the other after he has received a commission and has graduated.

Cadets designated potential pilots are required to register for the AFROTC Flight Instruction Program (FIP) during their Senior year. Successful completion of 36½ hours of flight instruction and a FAA examination enable him to gain three university credits. The entire cost of this training is paid for by the Air Force.

Cadets designated to become pilots and navigators are required to take flight training after reporting for active duty. During the year of flight training in the U. S. Air Force as a Second Lieutenant, a cadet will receive full pay and allowances, plus flight pay, a total of approximately \$7,500.

**Non-Flying 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 within the Air Force. These skills cover the exact sciences and social sciences but are not limited to these study areas. In many of these fields cadets may be granted

a year's delay to acquire an advanced degree prior to call to active duty. After their call to active duty they will serve four years in major fields of study. Interested cadets may 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 Master or Doctor's degree. The length of the delay depends upon current AFROTC regulations and directives. Students who are slated for flight training, however, must enter such training before reaching 26½ years of age.

**Texts and Uniforms.** All texts and uniforms are furnished at no expense to the student.

**Air Force Library.** A library of Air Force periodicals and publications is maintained for the Air Force ROTC Cadet. Material relative to the AFROTC curriculum is available.

**Air Force ROTC Counseling Service.** AFROTC Detachment maintains counseling services for each cadet. Service is offered primarily in areas concerned with the AFROTC curriculum (education, study and leadership).

**Air Force Angel Flight.** The Angel Flight is an AFROTC-sponsored organization of approximately 30 University women chosen by a composite board of judges. Former members of Angel Flights recognized by National Headquarters may transfer upon application. Applications for membership may be made by University women, except second and third quarter seniors. The purpose of the Angel Flight is to provide the University with an AFROTC Women's social auxiliary and to further the cause of the

U. S. Air Force by promoting the interest of college students in the AFROTC Program.

### Angel Flight Courses

61, 62, 63. **Aerospace Studies Angel Flight, Freshmen.** A course in leadership management and organization including drill and classroom activities for University women selected for membership (1F, 1W, 1Sp) **Staff**

64, 65, 66. **Aerospace Studies Angel Flight, Sophomores.** (1F, 1W, 1Sp) **Staff**

161, 162, 163. **Aerospace Studies Angel Flight, Juniors.** (1F, 1W, 1Sp) **Staff**

164, 165, 166. **Aerospace Studies Angel Flight, Seniors.** (1F, 1W, 1Sp) **Staff**

### Aerospace Studies

One hour of Corps Training is required each week during the Fall, Winter and Spring quarters for each year of Aerospace Studies.

### Aerospace Studies AS 100

#### First Year

#### General Military Course

10. An introductory course exploring the causes of present world conflict as they affect the security of the United States. The factors of national power, the types of conflicts nations will practice to achieve their goals. Two class periods per week. (2F) **Shriber**

11. **Democracy and Communism.** A comparative survey of the theory and practice to develop an understanding of opposed ideologies and their relevance to the cold war. Two class periods per week. (2W) **Shriber**

12. **Aerospace Power Orientation.** An introduction to contemporary aerospace equipment, weapon systems and their employment trends in the development and the impact of these trends on world affairs. Two class periods per week. (2Sp) **Shriber**

### Aerospace Studies AS 200

#### Second Year

#### General Military Course

21, 22, and 23. **World Military Systems.** These courses are a continuation of the Freshman courses of Air Force ROTC. They include studies of U.S. general purpose and tactical air forces and their roles in special warfare and counterinsurgency. Aerospace support forces are also studied. A detailed examination is given to the trends and implications in international affairs that highlight the con-

flict between democracy and communism, collective security organizations and the struggle, the search and the prospects for peace. Two class hours per week.

**21. U.S. General Purpose and Aerospace Support Forces.** Describes the limited war function of general purpose forces. Shows the role of the Army and Navy in limited war and how they each support the role of the unified command. The mission, resources, and operation of the tactical air forces are discussed showing their role in special warfare and counterinsurgency. The course concludes with an introduction to Aerospace Support forces by studying the need and capability of military airlift. (2F) **Burgoyne**

**22. Aerospace Support Forces—Conflict Between Democracy and Communism.** Aerospace support forces continues with a study of research and development support functions, the role of logistics in supporting our fighting forces, the education and training support roles in the Air Force and other support commands. The course is concluded with a study of the trends and implications in international affairs by examining the conflict between democracy and communism. (2W) **Burgoyne**

**23. Collective Security Organizations and Searching for Peace.** Highlights the alliances and collective security agreements entered into by the United States to help preserve peace. Discusses some of the specific problems and solutions involved in the search for peace. (2Sp) **Burgoyne**

## **Aerospace Studies AS 300**

### **First Year**

### **Professional Officer Course**

The following three-quarter course develops an understanding of the military characteristics of aerospace power and the development of doctrine governing its employment. Presents the role of space explorations and operations in maintaining general supremacy in aerospace. Includes the United States space programs, vehicles, systems and problems in space explorations. Three class hours per week.

**131. Growth and Development of Aerospace Power.** Study consists of the nature of war, history of airpower and impact of the nuclear weapon. (3F) **Miller**

**132. Growth and Development of Aerospace Power.** Study consists of importance of a national space effort, development of the space program, the spatial environment, orbits and trajectories, space vehicle systems, propulsions, propellants and power sources, instrumentation, communications, guidance and control, ground support systems, manned space flight and operations in space. (3W) **Miller**

**133. Growth and Development of Aerospace Power.** Study consists of the mission and organization of the Department of Defense and the future developments of aerospace powers. (3Sp) **Miller**

## **Aerospace Studies AS 400**

### **Second Year**

### **Professional Officer Course**

This course is concerned with depicting the Air Force as a profession, to develop understanding of the practicing of professionalism in the Air Force, to reveal the responsibility and authority of the Junior Officer duties.

**141. Military Professionalism.** The general characteristics of the Air Force profession, an understanding of the background of the Air Force officer's professional code. Military laws governing members of the Armed Forces, understanding the functions of the military justice system, basic principles and procedures of courts and boards. Three class hours per week. (3F) **Taylor**

**142. Leadership and Management.** The professional concept of military duty, management principles, responsibilities of commanders and members of command, leadership related to command and staff roles, factors and variables of leadership, functions of military discipline characteristics of human relation problems, Air Force personnel policies and channels of communication. Three classroom hours per week. (3W) **Taylor**

**143. The Junior Officer as Administrator.** Principles of organization, duties and responsibilities of the Squadron Officer, Air Force regulations, personnel problems, financial control, use of reports, Air Force management concept, machine accounting system, mechanized record keeping and the Air Force inspection system. Three classroom hours per week. (3Sp) **Taylor**

**145. Aerospace Studies. Flight Instruction Program.** This course covers instructions in ground school, Civil Air regulations, weather and navigation, radio and airways procedures, general service and operation of aircraft. Flight instruction includes 36½ hours on light aircraft and includes preflight checks, solos, cross country flights and FAA flight examinations. Subject open only to qualified Senior AFROTC Cadets. Instruction arranged not to interfere with regular academic schedule. Ground school taught on campus. (3F, W, Sp) **Staff**

**150. Aerospace Studies. Air Force ROTC Field Training.** Consists of four weeks (144 contact hours) of practical training at an Air Force Base and is directed toward providing a variety of practical Air Force experiences. Among the experiences offered in

tour and lecture form by Regular Air Force officers are electronic communications, navigation, supply, biological and chemical warfare, weather, traffic control, first aid and sanitation. Pressure and altitude chamber experience complete with orientation lectures, as given to regular Air Force jet pilots; permits cadets to ride in jet aircraft. A minimum of two flights is permitted to each cadet, one thirty minute jet ride and one ride in another type aircraft as a crew member. Cadets participate in preflight and postflight briefings, and receive emergency equipment indoctrination. Demonstration and field trips are provided to airfield installations and fire power

demonstrations. Practical leadership training is provided through group calisthenics, individual and group sports, familiarization firing of pistol and carbine and directing cadet operations. The cadet attends the Summer Training Unit between his Junior and Senior years. Exemption from attendance at this time is granted only by the Professor of Aerospace Studies based upon emergency situations of extreme hardship. If an exemption is granted, the cadet must attend summer training at the end of his Senior year and will be commissioned upon successfully completing the summer training if his university degree requirements have been met. (6Su) **Staff**

### Department of

## Military Science

**Head:** Professor Colonel Owen W. Owens, Artillery  
Office in Military Science 101

**Assistant Professors** Major Patrick D. Louney, Ordnance Corps; Major Scott J. Lehner, Armor; Major Thomas W. Wilke, Armor; Major Joseph Miller Jr., Quartermaster Corps.

ROTC's purpose is to develop reserve officers in sufficient quantity to provide a nucleus of well-educated, all-around leaders for an army that would have to expand rapidly in the event of a national emergency. In this present period of "limited" emergency, the program produces new Second Lieutenants for the Active Army and the Army Reserve. A limited number of Distinguished Military graduates are offered commissions in the Regular Army.

To be eligible for a commission as a Reserve Second Lieutenant a student must not have reached his 28th birthday prior to appointment. If he is commissioned in the Army Reserve and unless he has completed flight training, he will be required to serve two years on active duty. If he participates in flight training, he must serve three years on active duty.

**The Army ROTC offers a two and a four-year program.** The Army ROTC four-year program consists of two courses: Basic and Advanced.

To enroll in the Basic Course, students must be either a a) Freshman, b) Sophomore with credit for high school ROTC or other military training, c) Sophomore pursuing a course requiring four more years to earn the Bachelor's degree.

The two-year program is designed for students who transfer to the University from another institution where ROTC was not offered, to include junior colleges, or for those students of Utah State University who are unable to take the Army ROTC four-year program because of scheduling difficulties.

In the two-year program a Sophomore student will take the entrance examinations, go before a board of officers to determine

eligibility for commission and if selected for the Advanced Course will attend a six-week basic summer camp prior to enrollment in the Advanced Course.

After completion of the two-year Basic Course or summer camp and selection for further training, cadets may enroll in the Advanced Course, subject to any quota limitations. Under the provisions of the contract between the University and the Department of the Army, the University agrees to require that each student who enrolls will complete the course as a prerequisite to his graduation. Therefore, if he enrolls in the Advanced Course, he must complete that course unless relieved of this obligation by regulations prescribed by the Secretary of the Army. Signing of an ROTC draft agreement as a Basic Course student obligates him to elect enrollment in the Advanced Course if selected for it.

Any person who is selected and enrolled in the Advanced Course of Army ROTC will enlist in the Army Reserve but will not attend meetings other than ROTC classes. He will also sign a contract with the U. S. Army agreeing to serve as a Commissioned Officer for the period specified by law (2 years Reserve, 3 years Regular).

**Academic Course Substitutes.** Recognizing the modern Army leader's need for certain training to prepare him for responsibilities of diplomat, scientist, or statesman while in the military service, the Army has authorized substitution of certain academic University courses in lieu of some ROTC classroom instruction. In MS I, MS II a student must earn a minimum of three credits in one of the approved academic areas. During the MS III and MS IV years he must earn a minimum of four credits per year in courses from these same areas. These areas of interest are:

effective communications, science comprehension, political development and institutions, and general psychology. Lists of courses in these fields currently taught at this University are available through advisers or from the staff of the Military Science Department. These are not additionally required courses but, in effect, ones granting "dual credit"—they fill requirements for a major and meet requisites for ROTC training leading to a commission.

**Army ROTC Flight Training.** This training is offered to selected Senior Army ROTC students who meet Class I physical standards for flying. Instruction is so arranged that it will not interfere with ROTC or regular academic schedules. For acceptance in the course students must be enrolled in MS IV ROTC or have successfully completed MS III and summer camp. The flight program consists of 71½ hours of training: 35 hours of ground instruction and 36½ hours of actual flight instruction. Completion of this training will qualify a student for a FAA private pilot's license. All training is conducted by FAA-approved instructors. If interested in participating in flight training see the Military Science class adviser for further information.

**Summer Camp.** Advanced ROTC cadets must participate in a six weeks summer camp held at Fort Lewis, Washington. Attendance is required between Junior and Senior years unless a subsequent period is specifically approved by the Commanding General, Sixth Army. Practical application of classroom theory and living in the field make it an interesting and stimulating experience. Pay is received for the six-week period and for travel to and from camp.

**Payment at Basic Summer Camp.** Students who follow the two-year



course and must attend the basic six-week summer camp will be paid \$78 per month and travel pay to and from their home of residence and the camp at a rate of \$.06 per mile.

**Veterans.** Veterans may be given credit for all or part of the Basic Course, depending upon length of service. Enrollment in the Advanced program is contingent upon selection as in the case of other cadets.

**High School ROTC.** Students who have completed the three-year high school ROTC program may be given credit for the first year Basic Course.

**Military Science Major.** A major in Military Science is offered by the Army ROTC department. This major is intended to serve two categories: service personnel stationed at near-by military installations who desire to complete a degree while in the service, and college students interested in the possibility of making a career of the service. The latter who elect this major are required to complete a dual major, the purpose of which is to assure adequate preparation for the future in the event they are not selected or cannot qualify for a reserve commission. Further, it is not possible for a student to qualify for a major in Military Science if he fails to be selected for Advanced ROTC. Although all major fields at this institution are acceptable in a dual major, the following are particularly recommended: Engineering, Physics, Chemistry, Mathematics, Political Science, or Psychology. A Freshman student electing Military Science as a major is advised to pursue one of the above fields. In addition to Basic ROTC he should concentrate on filling lower division group requirements and strive for a high grade point average.

**Payment to Advanced Cadets.** Upon enrollment in the Advanced

Course students will enlist in the Army Reserve and will receive Retainer Allowance of \$50 per month for a period of twenty months. They will further receive a travel allowance to and from Advanced Course Summer Camp and their home of residence at a rate of \$.06 a mile. While at the Advanced Course summer camp the student will receive \$120 per month plus room and board. Upon entrance into active duty the cadet will receive a \$300 uniform allowance.

**Regular Commissions in the United States Army.** Each year outstanding Army ROTC cadets who have demonstrated a high degree of leadership, initiative and desire for a career as a Regular Army Officer are designated Distinguished Military Graduate and are offered an opportunity to apply for a Regular Army Commission.

**Delay of Entry on Active Duty.** When students have completed the Army ROTC program and are commissioned, they may delay entry upon active duty to continue advanced studies. The U.S. Army may delay call to active duty one year at a time up to four years providing the applicant shows acceptance to an accredited Graduate School and maintains requirements for retention in the Graduate School. In special cases, where more than four years are required for a Doctor's degree, additional delay time may be granted by Department of the Army.

**Texts and Uniforms.** All texts and uniforms are furnished at no expense to the student.

### **Pershing Rifles**

The National Society of Pershing Rifles was formed "to foster a spirit of friendship and cooperation among men in the Military Departments." Company "G," 9th Regiment, is located at USU. Mem-

bership in Pershing Rifles is open to any Army or Air Force basic or advanced cadet.

The Pershing Rifles is essentially a counter guerrilla organization designed for those students who have special interest in tactical and ideological aspects of counterinsurgency operations. The emphasis is placed on field training and maneuver. The Pershing Rifles also forms a separate rifle team to promote marksmanship among Army and Air Force Cadets as well as interested students not enrolled in ROTC. This rifle team competes in several important matches throughout the year with similar organizations from other institutions. The Pershing Rifles provides color guards and honor guards for various ceremonies both on and off campus.

### Pershing Rifles Courses

- |  |       |
|--|-------|
| 37, 38, 39. Pershing Rifle Drill, Freshmen.<br>(1F, 1W, 1Sp)   | Staff |
| 40, 41, 42. Pershing Rifle Drill, Sophomores.<br>(1F, 1W 1Sp)  | Staff |
| 137, 138, 139. Pershing Rifle Drill, Juniors.<br>(1F, 1W, 1Sp) | Staff |
| 147, 148, 149. Pershing Rifle Drill, Seniors.<br>(1F, 1W, 1Sp) | Staff |

### Sponsor Corps

Sponsor Corps is a semimilitary organization composed of 40 coeds chosen for the Corps by the Sponsor Staff, with final selection being made by a board of judges. Former members of Sponsor units recognized by the national organization may transfer upon application. Tryouts are accepted only from new students who have not previously tried out for entrance. The purpose of the Sponsor Corps is to provide official hostess and ushering service for the University, to perform as drill units in a variety of exhibitions and to assist the ROTC Department in furthering

their aims of military interest on campus.

### Sponsor Corps Courses

- |  |        |
|--|--------|
| 51, 52, 53. Sponsors Drill, Freshmen. A course in leadership organization and drill for women elected to Corps of Sponsors.<br>(1F, 1W, 1Sp) | Louney |
| 54, 55, 56. Sponsors Drill, Sophomores.<br>(1F, 1W, 1Sp)   | Louney |
| 151, 152, 153. Sponsors Drill, Juniors.<br>(1F, 1W, 1Sp)   | Louney |
| 154, 155, 156. Sponsors Drill, Seniors.<br>(1F, 1W, 1Sp)   | Louney |

### Military Science Courses

#### Basic Courses

#### MS I—First Year Basic

**Director:** Maj. Patrick D. Louney

- |   |        |
|---|--------|
| 11. Military Science I. Organization of the Army and ROTC; U.S. Army and national security; leadership, drill and command. One class period and one leadership laboratory period per week. (2F)       | Louney |
| 12. Military Science I. Continuation of Military Science 11. Individual weapons and marksmanship; leadership, drill and command. One class period and one leadership laboratory period per week. (2W) | Watson |
| 13. Military Science I. Continuation of Military Science 12. U.S. Army and national security; leadership, drill and command. One class period and one leadership laboratory per week. (2Sp)           | Louney |

#### MS II—Second Year Basic

**Director:** Maj. Thomas W. Wilke

- |  |       |
|--|-------|
| 21. Military Science II. American Military history, leadership, drill and command. Prerequisites: Military Science 11, 12 and 13 or 24. Two class periods and one leadership laboratory period per week. (3F)          | Wilke |
| 22. Military Science II. Continuation of Military Science 21. Map reading and aerial photography; operations and tactics; leadership, drill and command. Two class periods per week. (3W)                              | Wilke |
| 23. Military Science II. Continuation of Military Science 22. American Military Science; operations and tactics; leadership, drill and command. Two class periods and one leadership laboratory period per week. (3Sp) | Wilke |
| 24. Military Science II. Special Studies. Tutored study for students who have not been able to take Basic Courses at their regularly offered times. (3F, 3W, 3Sp)  | Wilke |

## Advanced Courses

### MS III—First Year Advanced

Director: Maj. Scott J. Lehner

131. **Military Science III.** Leadership; military teaching methods; drill and command; physical training. Two class periods per week and one leadership drill period per week (3F)

Lehner

132. **Military Science III.** Continuation of Military Science 131. Organization, function, and mission of arms and services; small unit tactics; communications, counterinsurgency; leadership, drill and command. Two class periods and one leadership laboratory period per week. (3W)

Lehner

133. **Military Science III.** Continuation of Military Science 132. Small unit tactics and communications; leadership, drill and command, physical training. Two class periods and one leadership laboratory period per week. (3Sp)

Lehner

150. **Military Science Summer Camp.** Attendance at summer camp is required of all Advanced Military Science students. Practical training for six weeks at a regular Army post subsequent to completion of Military Science III. (6Su)

Lehner

### MS IV—Second Year Advanced

Director: Maj. Joseph Miller Jr.

141. **Military Science IV.** Operations; logistics; leadership, drill and command. Two

class periods and one leadership laboratory period per week. (3F)

Miller

142. **Military Science IV.** Continuation of Military Science 141. Military administration and personnel management; Role of U.S. in world affairs. Two class periods and one leadership laboratory period per week. (3W)

Miller

143. **Military Science IV.** Continuation of Military Science 142. Military law; service orientation; leadership, drill and command. Two class periods and one leadership laboratory period per week. (3Sp)

Miller

145. **Military Science IV Flight.** An FAA-approved standardized flight program of instruction consisting of 35 hours of ground instruction and 36½ hours of flight instruction. Three additional hours are granted to meet unforeseen contingencies. Prerequisite: MS IV or completion of ROTC program; meet Army flight physical requirements.

(3F, W, Sp)

Wilke

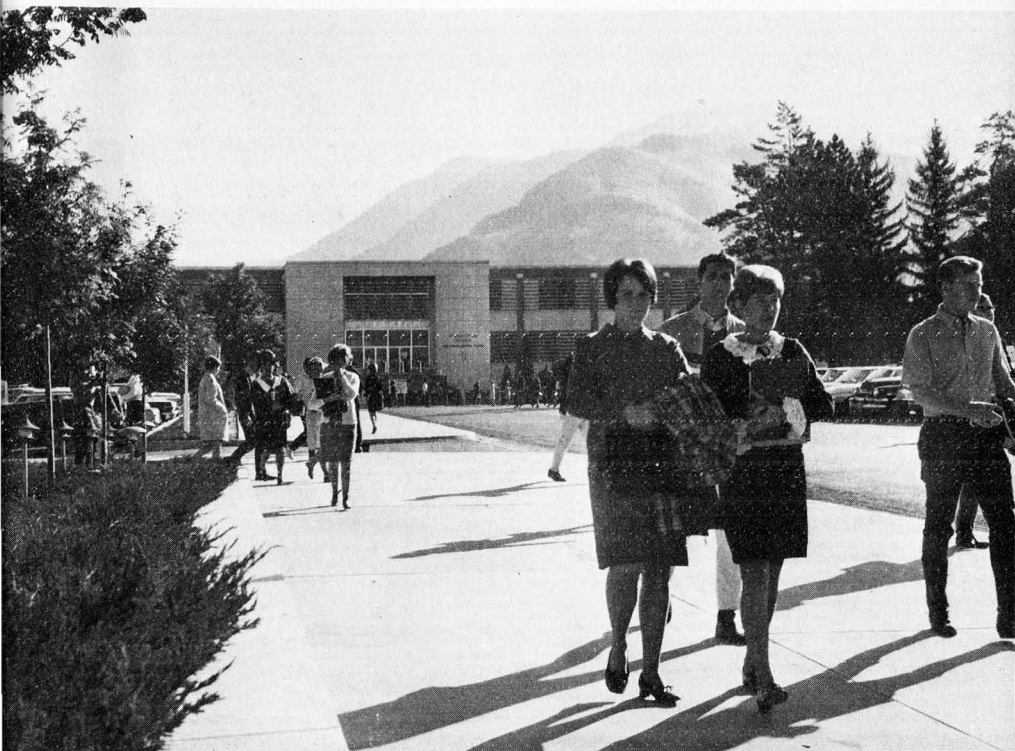
## Seminars

174. **Advanced Military Science Seminar Problems.** Prerequisite: Enrollment in or completion of Advanced Military Science. Credit arranged. (F, W, Sp)

















Staff

201. **Advanced Military Science Seminar Problems.** Prerequisite: Graduate standing. Credit arranged. (F, W, Sp)

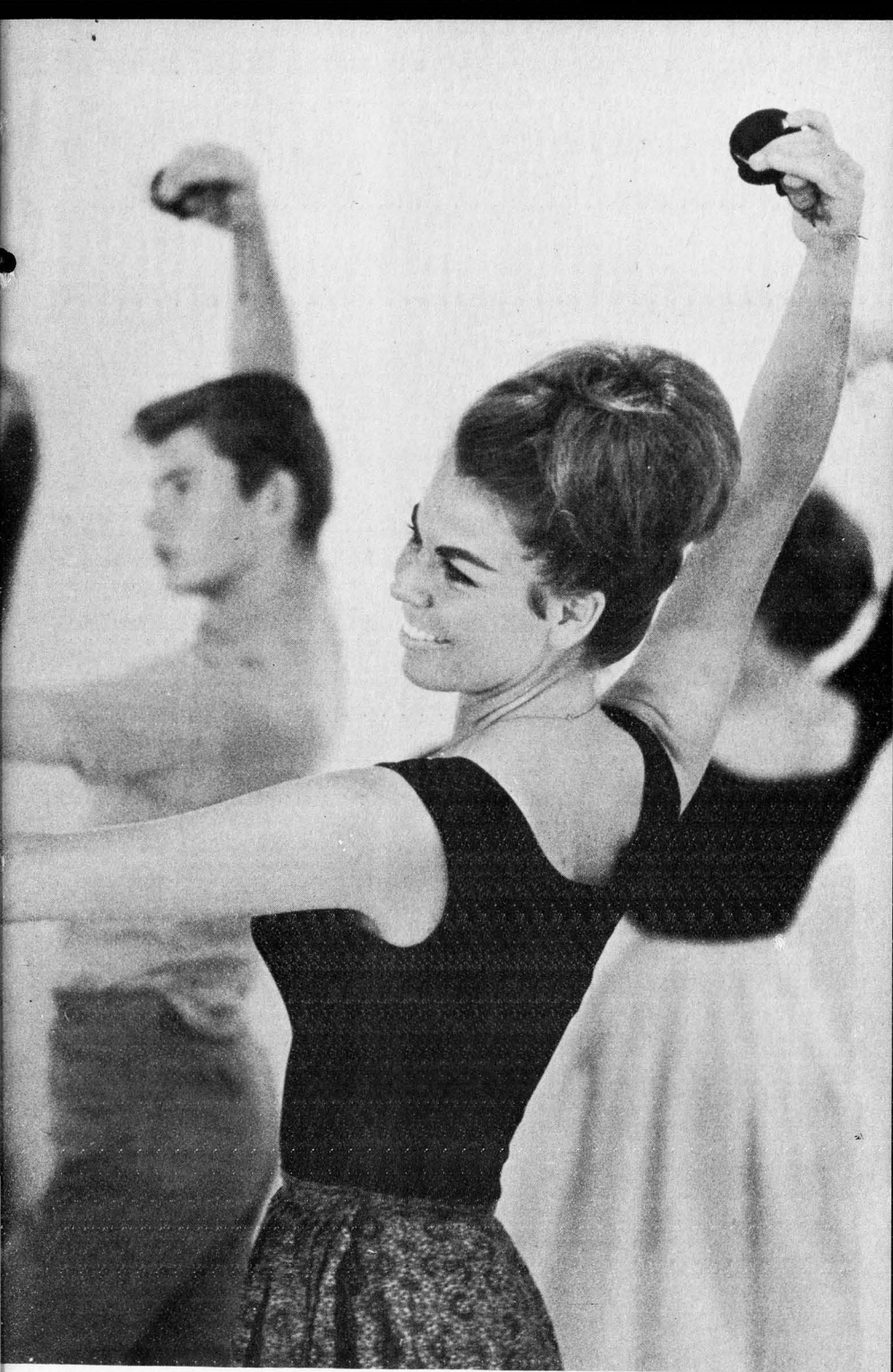
Staff





1	a		apple
2	b		boat
3	c		cake
4	d		doll
5	e		elephant
6	f		fox
7	g		gate
8	h		hand
9	i		Indian
10	j		jam
11	k		kite
12	l		ladder
13	m		milk
14	n		nut
15	o		octopus
16	p		pail





*COLLEGE OF EDUCATION*



College of

## Education

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Department of Elementary Education, 129

Department of Health, Physical Education and Recreation, 133

Department of Instructional Media and Library Science, 142

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Department of Special Education, 158

Degrees Offered:

Bachelor of Arts

Bachelor of Science

Master of Education

Master of Arts

Master of Science

Specialist in Education

Specialist in Educational Administration

Doctor of Education

## *College of*

# Education

John C. Carlisle, **Dean**  
 Oral L. Ballam, **Acting Dean**  
 Office in Education 203

Educating American boys and girls is one of the most challenging, exciting, and deeply satisfying of all professions. Over one-fourth of the citizens of our nation attend a school of one kind or another each day. There are nearly two million elementary and secondary school teachers in the United States today. More than 250,000 elementary and secondary teaching positions must be filled by trained teachers each year.

A teacher's work vitally affects not only today's young people, but also the future of our nation and the world. The future of mankind is linked to the education of youth as individuals and groups to strive to improve their situations and the world seeks creative solutions to problems.

In this regard, the College of Education has several principal functions. It prepares teachers, administrators, supervisors and other professional personnel for the public schools. Through graduate programs leading to advanced degrees it prepares college teachers. The departments of Psychology; Health, Physical Education and Recreation; Instructional Media and Library Science, in particular, have curriculum programs for the preparation of professional specialists in fields other than in Education.

Included within the College are the following departments: Elementary Education; Secondary Education; Educational Administration; Special Education; Health, Physical Education, and Recrea-

tion; Psychology; and Instructional Media and Library Science.

In addition to offering majors and minors, each department offers courses contributing to general education as well as courses designed to supplement the major work of other departments in the University.

The College of Education is a member of the American Association of Colleges for teacher education and is accredited through the Doctoral degree by the National Council for Accreditation of Teacher Education.

**Admission Requirements.** Enrollment in the lower division of the College of Education is dependent upon meeting the general admission requirements of the University. Each application is reviewed by the Dean of the College. However, admission to the professional education curricula requires formal action by a faculty committee on admission to teacher education. **The latter procedure applies to all curricula leading to graduation from any department and college in the University, wherein recommendations for professional certification in education are concerned.**

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

**Teacher Education.** The University offers complete programs of

Teacher Education in all phases of public school work. Cooperative programs with other departments of the institution provide for Teaching majors and minors required of all prospective secondary school teachers. Similarly, general areas of concentration in subject matter are required of all elementary teachers.

Careful attention is given to both staff and facilities in Teacher Education. Especially selected personnel at all training levels give students individual guidance.

Facilities in addition to the regular College of Education classrooms include the Nursery School, operated on the campus by the Department of Family and Child Development in the College of Family Life. Here Teacher Education focuses on the preschool child.

The Edith Bowen Teacher Education Laboratory School is a functioning elementary school in the University Campus. The teachers of the school are members of the University faculty. This school serves as a research and demonstration center in Elementary Education and in several aspects of Special Education. Scheduled observations of classroom activities by college students are part of the requirements of related courses such as child psychology, curriculum development, principles of teaching in the elementary school, educational psychology, and library science. A limited number of students are assigned to this school to complete part of the requirements in student teaching.

Students are not permitted to enroll in professional courses in education unless they have been admitted to the Teacher Education program, nor will a student be admitted to student teaching in any area of specialization unless his total grade point is 2.0 or above, and the grade point average in the teaching

major and minor and professional certification subjects 2.5 or above. **The student should be financially prepared to spend a quarter off campus student teaching.**

**The University Council on Teaching Education** coordinates all activities dealing with the preparation of teachers and other professional school personnel. Members of the council are appointed by the President of the University from the College of Education and from other departments offering courses included in teaching majors and minors. The Dean of the College of Education serves as chairman of the council.

The council is concerned with 1) development of Teacher Education curricula; 2) approval of all Teacher Education curricula; 3) selection, admission, and counseling procedures for students entering Teacher Education programs.

**Teacher Certification.** The College of Education is designated by the Utah State Department of Public Instruction as one of its official representatives in administering certification requirements for students.

The University provides training to prepare students for any of the professional certificates issued by the Utah State Department of Public Instruction. Teaching specialties for which certificates may be issued are listed within the departmental information sections.

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

As a valuable and integral part of Teacher Education for the Elementary or Secondary certificate, a closely supervised program of student teaching is conducted. In Elementary Education student teaching is done in the Edith

Bowen School, and in cooperating public schools. In Secondary Education, all student teaching is done in selected public schools throughout the state.

The Bachelor of Science degree with a major in Elementary or Secondary Education is designed for the 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 both the elementary and the secondary certificates should consult with an adviser in the Education Department early in his program. Ordinarily, dual certification will require at least one additional quarter of work.

**On the graduate level,** programs are offered for students who desire to meet requirements for administrative, supervisory, teaching or other advanced professional certificates. The MEd, MS, MA, and EdD degrees, as well as the Specialist in Educational Adminis-

tration degree requiring a two-year sequence in graduate work, are offered. The College of Education also cooperates with the College of Engineering in providing a program leading to a Doctor of Education degree in Industrial Education. More detailed information concerning graduate work is found in the Graduate School section of this catalog. A separate catalog describing graduate programs is issued by the School of Graduate Studies.

**Teacher Placement Service.** The University is interested in placing its graduates in professional positions. To accomplish this purpose in the College of Education, the Teacher Placement Service functions as an integral part of the University Placement Center. If students qualify for a teaching or other professional certificate, they must register with the Service as a help in compiling the proper credentials to be used in placement. Application for membership should be made prior to student teaching whenever possible. No fee is charged for membership in the Center.

### Department of

## Educational Administration

**Head:** Professor Homer M. Johnson  
Office in Education 206

**Professors** Oral L. Ballam, LeRoy A. Blaser, John C. Carlisle, Lloyd A. Drury, Basil Hansen, Terrance E. Hatch, Ellvert H. Himes; **Associate Professors** Arthur D. Jackson, Charles O. Ryan; **Instructor** James A. Jacobson

**Degrees:** Master of Science (MS), Master of Education (MEd), Specialist in Educational Administration (Spec. Ed. Admin), Doctor of Education (EdD)

**Major:** Educational Administration

Of the degrees offered from the Educational Administration Department, the Master's degree is

primarily to meet the principal's certification requirement in certain states. The Specialist in

Educational Administration is offered for those who wish to qualify as superintendents, staff administrative personnel, or elementary and secondary school principals. In addition, the Doctor's degree is intended to train people for top administrative positions or higher level teaching positions. The Specialist in Educational Administration (two years beyond the Bachelor's degree) will meet the certification requirements for superintendents and elementary or secondary principals in Utah. The Doctorate goes beyond present certificate requirements. Both degrees, however, meet the standards for membership in the American Association of School Administrators.

All programs through the Doctor's degree are approved by the National Council for Accreditation of Teacher Education, which in turn means approval by AASA.

Programs offered by the department will satisfy the certification requirements outlined by the Utah State Board of Education. Candidates may seek either a basic professional or a professional certificate for positions as elementary principals, secondary principals and superintendents. To receive a basic professional endorsement requires a Master's degree or 55 quarter credits in an approved program in school administration. The professional endorsement requires a planned two-year graduate program in Educational Administration. Other specific requirements are outlined in the regulations of the State Board of Education. Details of these programs are available from the Department of Educational Administration. For additional information and more specific details, see the Graduate Catalog.

## Educational Administration Courses

- 150. The American School System.** Fundamental principles of operating public schools with emphasis on Utah conditions. An analysis of the public schools system as it has developed in the United States. (3F, W, Sp, Su)  
**Ballam, Hansen, Jacobson, Ryan**
- 153. Social Foundation of Education.** A course designed for study of basic social organizations and their effect on educational theories and practices. (3F)  
**Hansen**
- 154. History of Education.** Major educational movements from early Greek to the present, with emphasis on purposes, organization, instructional procedures, curriculum, etc., and their bearing on today's education. (3Sp, Su)  
**Hansen**
- 207. Elementary School Administration.** Operation and management of the elementary school. (3W, Su)  
**Ryan, Jackson**
- 236. Secondary School Administration.** Topics in secondary school administration, including problems of teacher-pupil personnel, the principal as supervisor, and managing the activity program. Designed for experienced school principals, and those preparing for the administrator's certificates in secondary education. (3W, Su)  
**Hatch**
- 254. Organization and Administration of Education.** The work of the school administrator and the principles upon which the profession of school administration is practiced. Federal, state, and local relations to education. (3F, Sp, Su)  
**Ballam, Hatch, H. Johnson**
- 258. Organization in Educational Administrative Behavior.** This course is designed to give prospective administrators opportunity to relate course work and training to an analysis and solution of real or simulated problems in educational administration. Limited to MEd or Specialists in Educational Administration candidates only, or by permission of instructor. (3Su, W)  
**Ballam, Johnson**
- 260. Historical and Philosophical Foundations of Education.** Deals with major philosophies of education in their historical setting and their effect upon subsequent development of the American school system. (3F, Su) **Hansen**
- 261. Organization and Administration of Special Education.** This course is designed to provide public school administrators with background and training for the administration of special education. It will deal with the background and purposes of special education, the systems and organization for programs and financing, and the legal implications related to programs. The student will become acquainted with identification procedures and community, school, and parent relationships. Involvement will be provided in current issues and trends in special education. (3F, Su) **Ryan**



**262. Organization and Administration of Guidance.** An analysis of concepts, plans, relationships, and problems involved in the effective development and operation of guidance services and activities at all levels of education. (3Sp, Su) **Himes**

**264. Instructional Leadership in Education.** See Sec Ed 264. (3F, Su) **Staff**

**265. Computer Application and Systems Design in Education.** This course will provide educational administrators and others with an understanding of computer capabilities. To fully understand the capabilities, it is necessary to gain knowledge about how a computer actually works. Having established some fundamentals of the science, the student will gain an understanding and application of computers to media in education, operations research, business administration, content research, student scheduling, and simulation of educational problems. Basic to computer applications, the student will become knowledgeable in the area of flow charting, systems designing and systems analysis in the educational setting. (3W, Sp, Su) **Staff**

**266. Introduction to Research in Education.** This course is to provide teachers and school administrators with research tools that they may apply directly to their practical problems. The specific objectives of the course are: 1) to give students an appreciation of scientific methods of problem solution, 2) to acquaint students with a research literature in Education and teach them how to use it, 3) to provide training and experience in action research, 4) to teach students how to plan, carry out, and report a project for the Master of Education degree. Prerequisite or taken concurrently: Sec Ed 164. (3F, Sp, Su) **Staff**

**267. Research in Psychology and Education.** Deals with identifying a problem for the thesis, reviewing and evaluating research literature, and designing and carrying out the research project. A portion of the student's thesis or seminar report is prepared as the term paper. The instructor schedules individual conferences to assist the student in the initial planning of his thesis or seminar report. Prerequisite: Psy 112. (3F, Sp, Su) **Shaver**

**269. Comparative Education.** A study of the school system and educational problems of Europe, Latin America, the Middle East, Far East, and Russia. Students from foreign lands and resident faculty members personally acquainted with various educational programs are utilized as resource persons. (3W, Su) **Hansen**

**270. Public Relations in Education.** Objectives, guiding principles, techniques and media for an improved school public relations program. (3W, Su) **Hansen, Ballam**

**274. Legal Aspects of School Administration.** Emphasizes responsibilities and functions of local and district school administrators. Interpretation of legal status, form and procedure, as established by statutes, legal opinions, and court decisions. (2Sp, Su) **Hatch**

**276. Field Experience in School Administration.** Provides introductory experiences in school administration. Students work a minimum of five hours weekly under the direction of an administrator in the public schools, either elementary or secondary. The University supervisor will direct programs and meet in seminars periodically. Credit arranged. (F, Sp, W, Su) **Hatch, Jackson**

**283. Reading and Conference.** Provides for individually directed study in subjects of special interest and preparation. Credit arranged. (F, W, Sp, Su) **Staff**

**285. Research and Thesis Writing.** Individual work in thesis writing and seminar reporting with guidance and criticism. Credit arranged. (F, W, Sp, Su) **Staff**

**350. Seminar in Administrative Theory and Research.** The seminar will concentrate on current theories about administration and the contribution of behavioral science research to the problems of organization and administrative behavior. An expected by-product is the student's growing awareness of significant problems in educational administration which can be researched. The appropriateness of various research methodologies to specific kinds of problems will be considered, although the seminar does not stress formal instruction in either research methodology or statistical analysis. Doctoral students only. (3F) **Johnson, Hatch, Ryan**

**351. Seminar in Communications Theory and Research.** Internal communication of the organization constitutes an essential ingredient of the administrator's effectiveness. In addition, the change of behavior of individuals requires, fundamentally, a communications process. Of equal importance is the problem of communications between the organization and its supporting public. This seminar will help the student gain insight into the variables that effect this total communications process. Research will be reviewed to better understand attitude and opinion change. Doctoral students only. (3W) **Johnson, Ballam, Ryan**

**352. Seminar in Problems of Educational Administration.** Basic to the understanding of the administrative process is the ability of the student to see clearly the relationship between theory and practice. By employing certain simulation techniques it is hoped that the student will be able to employ theory in the analysis and solution of problems. In addition, the doctoral student should begin to conceptualize issues in international relations, cultural anthropology, comparative education and economics. Opportunities will exist for the

teachers involved to evaluate both students and program. Doctoral students only. (3Sp)

**Johnson, Ballam, B. Hansen, Ryan**

**355. School Building Programs.** School housing surveys, location and capacity of schools, instructional needs as a basis for planning, standards for equipment, checking plans and specifications, business and legal provisions governing financing and construction of new buildings, bids and contracts. (3F, Su)

**H. Johnson**

**360. Philosophy of Education, Advanced.** An analysis of the major philosophies of education and their implications for current educational practices. (3Sp, Su)

**Hansen**

**361. Readings in Foundations of Education.** Considers problems of education in terms of their sociological, historical, and philosophical foundations. (3W, Su)

**Hansen**

**362. Group Processes in Educational Leadership.** Analysis of the work of the school administrators and supervisors in dealing with various groups concerned with public education, school faculties, boards of education, parent-teacher groups, and the like. Research from studies in group dynamics will be drawn upon. (3W, Su)

**H. Johnson**

**367. Administration of School Personnel.** Principles and practices in management of teachers, other school employees, and pupils. (3W, Su)

**Ballam**

**368. Higher Education.** A study of the development and current status of education beyond the high school in America. (3W)

**Himes**

**374. Practicum in Public School Surveys.** The students in the class will participate in making a field study or survey of a school district. Classroom discussions will be concerned with practical problems of the particular district. Education literature dealing with the area of school surveys will also be extensively considered. Open only to advanced students in school administration with the specific approval of the instructor. Time and credit arranged. (W)

**H. Johnson**

**381. School Finance.** Historical background of school finance; principles and practices involved in collecting and distributing school revenues, with special reference to conditions in Utah. (3F, Su)

**Ballam, Ryan**

**382. School Business Management.** A study of the factors involved in the efficient business management of school systems and individual schools. For school administrators, school business managers, clerks and students preparing for these positions. (3Sp, Su)

**Ryan**

**384. Internship in School Administration.** Provides extensive experience for the advanced student working on the Doctor of Education degree in School Administration. Class members work a minimum of one quarter full time under the direction of an administrator in the public schools. Credit arranged. (F, W, Sp)

**H. Johnson, Ballam**

**385. Field Studies and Thesis.** Formerly 375. Individual work on research problems in the EdD program. Credit arranged. (F, W, Sp, Su)

**Staff**



## Department of

# Elementary Education

**Head:** Professor Malcom Allred  
Office in Education 310

**Associate Professors** Bryce Adkins, Arthur D. Jackson, L. Gail Johnson, Jean Pugmire, Edith S. Shaw; **Assistant Professors** Joan C. Bowden, Maurice A. Derbyshire, Barbara B. Howell, Jay A. Monson, Morris Mower, Ivan Pedersen, Kathryn S. Smith, Helen Tanner, Thomas A. Taylor, R. Eyre Turner, Evelyn Wiggins; **Associates** Jack W. Foreman, Betty Janiak, Kenneth Morgan, Gerald R. Sherratt, Anne Smith, John R. Williams

**Degrees:** Bachelor of Science (BS), Master of Arts (MA), Master of Education (MEd), Master of Science (MS), Doctor of Education (EdD)

**Major:** Elementary Education

## Undergraduate Study

Completion of the following departmental requirements will fulfill the basic University requirements listed by the Office of Admissions and Records and teacher certification requirements of the Utah State Board of Education. Students must meet the departmental requirements in order to graduate from the University and to receive a teaching certificate endorsed for elementary school (K-6) teachers.

Students seeking additional or special endorsements to the Basic Professional Certificate must plan to meet additional course work requirements for the particular endorsement. Endorsements to the Basic Professional Certificate may be in such areas as the following: kindergarten education, remedial reading, special education, and others. A list of requirements for special endorsements may be obtained from the department office or from the adviser.

A student interested in meeting certification requirements in another state should check with the State Department of Education in that state and with his adviser for specific course requirements.

A student must be admitted to the Teacher Education Program before he is permitted to enroll in professional education courses. Application for admittance to the Teacher Education Program must be made to the Office of the Dean of the College of Education. Copies of the requirements may be obtained from the department office or from the Dean's office.

## Lower Division Requirements

Group	Credits Required
<b>Natural Sciences</b> .....	21
Biological Sciences .....	10
Biology, Bacteriology, Botany, Entomology, Forestry 110, Physiology, or Zoology	
Physical Sciences .....	11
Chemistry, Geology, Meteorology, Math 21 and 22 (required), Math 23, or Physics	
(One Science course must include a lab)	
<b>Social and Behavioral Sciences</b> .....	15
General Psychology 53 .....	5
History 20, Political Science 10, or Economics 51 .....	5
Electives not already selected from above list .....	5
<b>Humanities</b> .....	25
English 1, 2, 3 .....	9
Literature and Speech .....	10
(from each unless otherwise advised)	
Fine Arts .....	6
(from two of the following areas:	
Music, Art, Theatre Arts)	

**Physical Education** ..... 3

See Section V. Physical Education in the Lower Division Requirements section listed by the Office of Admissions and Records in the forepart of this catalog for specific classes and waiver rights.

Classes used to satisfy the above requirements are not to be counted toward the major or minor(s). A copy of elective courses approved to fill the Lower Division Requirements may be obtained from the department office or from the student adviser. All students meeting requirements for a teaching certificate in Elementary Education must have an adviser in the Department of Elementary Education who will approve the student's program, even though the student may have an adviser in another department.

**Areas of Academic Concentration**—Courses designed to provide study in depth for the elementary school teacher:

A field of concentration consists of not less than 36 credits selected from an academic or subject area taught in the elementary school (science, social studies, physical education, etc.).

A supporting minor consists of not less than 18 credits selected from an area not taught in the elementary school but which is directly concerned with the pupils, the profession, or the school.

A subject minor consists of not less than 18 credits selected from an academic or subject area taught in the elementary school. (Science, social studies, physical education, etc.).

Each student must select one of the following with the approval of his adviser in Elementary Education: 1) One field of concentration: 36 credits required; 2) two subject minors: 18 credits required in each minor; 3) one subject minor and one supporting minor: 18 credits required in the

subject minor and 18 credits required in the supporting minor.

Students are encouraged to go beyond these minimum requirements and must include some upper division courses in the selected area of concentration or minors.

The Department of Elementary Education shall determine those fields of concentration subject minors, supporting minors, and courses which are acceptable and meet the requirements. Students may obtain lists of approved courses from the department office or from advisers.

**Professional Education Major.**  
A major of at least 48 credits in professional education courses is required as follows:

**Group I, Understanding the Child**  
(minimum of 9 credits)

Psychology 100 or CD 100 .....	3
Public Health 155 .....	3
Additional credits selected from the following: Psychology 123, 145, 180, 181, 182, 183; Speech 67; Child Development 67....	
	3

**Group II, Understanding the School** (minimum of 7 credits)

Education 100 .....	4
Education 150 .....	3

**Group III, Curriculum and Methods** (minimum of 32 credits)

Education 104 .....	5
Education 105 .....	3
Education 106 .....	12
Education 107 .....	3
Psychology 106 .....	3

**Elective Courses** (minimum of 6 credits) selected from the following:

Education 102 .....	3
Education 108 .....	3
Education 109 .....	3
Education 112 .....	3
Education 116 .....	3
Education 161 .....	3
Education 186 .....	3
English 122 .....	3
Music 150 .....	3
Art 151 .....	3
Physical Education 177 .....	3
Physical Education 182 .....	3
Instruction Education 180 .....	3



Speech 118 .....	3
Speech 122 .....	3
Forestry 110 .....	3

(Other courses may be selected with the approval of the adviser.)

### Suggested Sequence of Courses First and Second Years

Concentrate on filling lower division requirements and beginning work in the major or minor fields.

Third Year	Fourth Year
Psychology 100	Psychology 108
Public Health 155	Education 104
Education 100	Education 105
Education 150	Education 106

Courses to complete the major field of concentration or two minors. Elective courses in Education and related areas.

A student is not permitted to enroll in professional courses in education unless he has been admitted to the Teacher Education Program, nor will a student be admitted to student teaching in elementary education unless his total grade point is 2.0 or above and the grade point averages in the areas of academic concentration and professional certification subjects are 2.5 or above.

**The student must be financially prepared to spend a quarter off campus student teaching.**

At the graduate level, the Department of Elementary Education assists in the preparation of students seeking the MA, MEd, MS, and EdD degrees. Students who desire information relative to the graduate programs should write to the Dean of the School of Graduate Studies or to the head of the Department of Elementary Education for detailed information.

### Elementary Education Courses

**100. Principles of Elementary Education.** An introduction to the elementary school, its background and development, philosophy, personnel, practices, achievements, and its place in the American system of education. (4F, W, Sp, Su) **Williams**

**102. Teaching the Language Arts.** A study of language development in children and its implication for classroom practice: listening, speaking, writing and reading. (3Sp, Su) **Wiggins**

**104. Elementary School Curriculum.** Familiarizes prospective teachers with the nature and content of the elementary curriculum and factors that influence its development. Includes an introduction to the teaching guides for Utah elementary schools, and considers some of the objectives, methods of instruction, teaching aids and materials, and sources of information related to the curriculum. (5F, W, Sp, Su) **Allred, Wiggins**

**105. Principles of Teaching in the Elementary School.** The purposeful activity of the child as the basic factor determining teaching procedure. Significance of individual differences in application to schoolroom practices. Consideration of classroom planning, organization and environment. To be taken concurrently with student teaching. (3F, W, Sp, Su) **Shaw, Pugmire, Wiggins, Allred**

**106. Student Teaching in the Elementary School.** For Juniors and Seniors who have had a substantial amount of professional course work including Principles of Elementary Education, Educational Psychology, and Elementary School Curriculum. The apprentice plan is followed which requires an initial period of observation with minor responsibilities but with gradual increase of work and responsibility as the student's ability is demonstrated. **Application for student teaching must be arranged two quarters in advance of registration for student teaching.** Students who have credit for other courses in student teaching, or who have successful teaching experience, may register, by special permission of the instructor, for less than twelve credits.

Students enrolled in this class may be assigned by the University to work in selected public schools throughout the state and must make plans to spend this quarter off campus. (12F, W, Sp) **Staff**

**106-A. Student Teaching in the Elementary School.** For experienced teachers or individuals who have completed requirements for the secondary certificate and are preparing also for elementary. At least one-half day is required for one full quarter. The student will be assigned to a sponsor teacher in the campus laboratory school or in the public schools. Ed 105 must be taken or audited concurrently. (5F, W, Sp) **Staff**

**106-B. Student Teaching in the Elementary School.** For experienced teachers or individuals who have completed requirements for the secondary certificate and are preparing also for elementary. At least one-half day is required for a Summer Session or part of a quarter. The teacher will be assigned to a sponsor teacher in the campus laboratory



school or in the public schools. Ed 105 must be taken or audited concurrently. (3Su)  
Staff

**107. Teaching of Reading.** Considers the objectives of the reading program, stages of reading development, skills and attitudes to be gained, the materials of instruction, and the experiences of children that contribute to the achievement of the objectives in reading. Opportunities for observation of reading situations in elementary school classrooms. (3F, W, Sp, Su) G. Johnson, Shaw, Wiggins

**108. Social Studies in the Elementary School.** Organizing the elementary curriculum to provide social studies experiences consistent with the nature of the child and the democratic society in which he lives. (3W, Su) Allred

**109. Science in the Elementary Grades.** Investigation of the aims of science programs. Acquaintance with the materials, techniques of instruction, and experiences that may help children gain the skills, understanding, and attitudes desirable in this subject area. (3W, Sp, Su) Adkins, T. Taylor

**110. Principles of Conservation.** See Forestry 110. (3F, Su) C. Johnson

**112. Arithmetic in the Elementary School.** The place of arithmetic in the elementary school curriculum and methods of teaching it in the several grades. (3F, Sp, Su) Adkins, Jackson, T. Taylor

**116. Curriculum and Methods for Kindergarten.** The study of the kindergarten program with emphasis on the influence of recent research in child development and human relations. Special attention will be given to planning the curriculum, methods, materials and equipment used in the kindergarten. (3F, Su) Pugmire, Shaw

**128. Principles of Guidance.** See Sec Ed 128. (3F, W, Sp) Himes

**153.** See Educ Admin 153, Social Foundations of Education. (3F) Hansen

**154.** See Educational Administration 154, History of Education. (3Sp, Su) Hansen

**155.** See Utilization of AV Media IMLS 155. (3F, W, Sp Su) Essig

**164. Measurement and Evaluation in Education.** See Sec Ed 164. Borg, Himes

**165.** See IMLS 165. Production of Audio-Visual Materials. Staff

**186. Diagnosis and Treatment of Learning Difficulties.** See Sec Ed 186. (3F, W, Sp, Su) Stone

**204. Elementary School Curriculum, Advanced Course.** Designed for experienced teachers. It deals with new concepts in elementary cur-

riculum resulting from recent research in the field. Class members will have opportunity to develop curriculum materials in their areas of interest. (3F, Sp, Su) Adkins, Allred

**205. Improvement of Kindergarten Education.** An advanced course in kindergarten education for experienced teachers. It includes an evaluation of the kindergarten program based upon the latest research in the areas of psychology, child development, education, and sociology. (3W, Su) J. Pugmire

**207. Elementary School Administration.** See Educ Adm 207. (3F, Su) Allred, Jackson

**213. Diagnosis of Reading.** For teachers, supervisors, and others interested in remedial reading instruction. Concerned with causes of reading disability, diagnostic tests, and procedure used in remedial reading. Prerequisite: Ed 107 or two years teaching experience in the elementary school. (3F, Su) G. Johnson, M. Mower

**214. Remedial Reading Instruction.** Designed to follow Ed 213. Considers the nature of remedial reading instruction, selection of remedial students, group and individual instruction, methods and materials used in remedial reading programs. (3W, Su) G. Johnson, M. Mower

**216. Practicum in Remedial Reading.** Designed to follow 213 and/or 214. Provides opportunity for the student to work with children in need of remedial help in reading. Enrollment only with the consent of the instructor. (3W, Sp, Su) G. Johnson, M. Mower

**219. Seminar in Elementary Education.** Considers those areas of elementary education in which members of the class desire to gain modern authoritative viewpoints. Opportunity for both individual and group work. (3W, Su) Adkins, Allred

**220. Creative Education in the Elementary School.** Exploration of research concerning creativity in education and ways and means of utilizing basic principles in this area in the improvement of classroom practices. (3W, Su) Shaw

**225. Improvement of Reading in the Elementary School.** In addition to a concern for an adequate developmental reading program, emphasis will be placed on helping the child who is having reading difficulties. Prerequisite: Ed 107 or teaching experience in elementary school. (3F, Su) G. Johnson, M. Mower

**226. Improvement of Science in the Elementary School.** For experienced teachers. Deals with newer concepts in curriculum and methods of instruction in science in the elementary schools. Prerequisite: Ed 109 or teaching experience in elementary school (3W, Su) Adkins

**227. Improvement of Arithmetic and Mathematics in the Elementary School.** For experienced teachers. Deals with newer concepts in curriculum and methods in mathematics instruction in the elementary school. (3Sp, Su)

**Adkins**

**228. Improvement of Social Studies in the Elementary School.** For experienced teachers. Deals with newer concepts of curriculum and methods of instruction in social studies in the elementary school. Prerequisite: Ed 108 or teaching experience in elementary school. (3Sp, Su)

**Allred**

**229. Improvement of Language Arts in the Elementary School.** For experienced teachers. Deals with newer concepts in curriculum and methods of instruction in language arts in the elementary school. (3Sp, Su)

**Wiggins**

**232. Aerospace Education.** See Sec Ed 232. (3Su)

**Staff**

**258. See Practicum in Evaluation and Improvement of Instruction.** See Sec Ed 258. (3Su)

**259. Supervising Student Teaching.** Considers ways and means of providing desirable experiences for student teachers in the public schools. The role of the classroom teacher and the college supervisor will be analyzed. Credit arranged. (F, Su)

**Budge, Shaw, Wiggins**

**264. Instructional Leadership In Education.** See Sec Ed 264. (3W, Su)

**Allred**

**266. Introduction to Research in Education.** See Educ Adm 266. (3F, Sp, Su)

**Carlisle**

**267. Research in Psychology and Education.** See Educ Adm 267. (3F, Sp, Su)

**Staff**

**283. Reading and Conference.** Provides for individually directed study in subjects of special interest and preparation. Credit arranged. (F, W, Sp, Su)

**Staff**

**285. Research and Thesis Writing.** Individual work in thesis writing with guidance and criticism. Credit arranged. (F, W, Sp, Su)

**Staff**

**364. Theories of Teaching.** See Sec Ed 364. (3Sp, Su)

**Allred, Farrer**

**365. Curriculum Development.** See Sec Ed 365. (3Sp, Su)

**Allred, Farrer**

**366. Internship in School Supervision.** See Sec Ed 366. (F, W, Sp)

**Staff**

**385. Field Studies and Thesis.** Individual work on research problems in the EdD program. Credit arranged. (F, W, Sp, Su)

**Staff**

## Department of

# Health, Physical Education and Recreation

**Head: Professor H. B. Hunsaker**  
Office in Smart Gym

**Professor Dale O. Nelson; Associate Professors Lois Downs, Lincoln H. McClellan; Assistant Professors Nolan K. Burnett, Pauline Fuller, Arthur H. Mendini, Janice Pearce, H. Dale Rasmussen; Instructors Gordon E. Belnap, Paul R. Boyce, Lucille Chase, Jacqueline W. Fullmer**

**Degrees:** Bachelor of Science (BS), Master of Science (MS)

**Majors:** Physical Education, Health Education, Recreation Education

In the activity courses opportunity is given to develop skills in some physical activity that will help establish a permanent interest in healthful recreation, promote

physical fitness, build morale, and maintain health.

All students under the age of 31 must meet the school requirement of three quarters of Physical Edu-

cation. This requirement should be met by the end of the sixth quarter of residence work. Men may meet this requirement by taking Military Science or Aerospace Studies. (It is recommended that requirements a) and b) below be completed during the first year.)

The requirement must be met by taking: a) Physical Education 1 (Basic Physical Education), b) a swimming course—Note: Either or both of these courses may be met by passing waiver tests administered by the Physical Education Department after which students may select courses rather than register for required courses a) and b). Selected courses are from five activity groups. Only one course from a group may count toward the requirement. Courses, by groups, are as follows:

**Aquatics:** All swimming classes.

**Dance:** All dance classes.

**Dual Activities:** Boxing (Men), Wrestling (Men), Fencing, Badminton, and Tennis.

**Individual Activities:** Skiing, Track (Men), Bowling, Weight Training (Men), Self-Defense (Men), Trampoline (Men), Tumbling-Gymnastics (Men), Tumbling Stunts (Women), Adapted Body Conditioning (Women), Archery, Golf, and Cross Country (Men).

**Team Activities:** Football (Men), Baseball (Men), Softball (Men), Basketball (Men), Soccer (Men), Volleyball (Men), Soccer-Speedball (Women), Volleyball (Women), Basketball (Women), Softball (Women), and Field Hockey (Women).

**Intramural Activities** are conducted by the department. The intramural program is planned to give moral, social, physical and educational values derived from competitive sports. This program provides for both individual and

team endeavor, and the department attempts to make it possible for all students to participate.

The Women's Intramural Association offers a varied program of activities. All women are eligible and encouraged to participate in any of the activities offered.

The department offers an extensive intramural sports program for men. Competition in a variety of activities is conducted in separate leagues: fraternity, department, club, and all-campus. All men are encouraged to participate in one of these leagues.

**Recreation.** The department attempts to meet recreational interests of the total studentbody. Through intramural sports, student clubs, recreation periods, and special events, a variety of recreational opportunities are offered. The purpose of these activities is to develop a love for wholesome recreation, and sufficient skill to allow individuals to participate with satisfaction and enjoyment in various activities.

## Undergraduate Study

A student may major in Physical Education with specialization in Elementary Physical Education, Secondary Physical Education, Professional Scouting or Pre-Physical Therapy. Selection of a program of study in these areas should be carefully planned under the guidance of advisers. The following courses, in addition to the three credits required for graduation, are suggested for each of the above areas:

If specializing in Elementary Physical Education, the student should complete Physical Education 24, 55, 75, 81, 83, 85 or 92, 106, 120, 177, 182, 183, 184; six credits in Sports Techniques and six credits from approved electives.

If specializing in Dance, a student should complete Physical Edu-

cation 21, 24, 26, 77, 78, 79, 83, 102, 103, 104, 106, 107, 111, 120, 121, 140, 150, 151, 153, and 14 credits selected from the following courses in Theatre Arts: 50, 52, 55, 57, 59, 152 and 154. PE 165, 183, 192.

For a composite major in Dance and Physical Education a student should complete Physical Education 20, 24, 26, 74, 75, 77, 78, 79, 81 or 83, 92, 102, 104, 106, 107, 108, 111, 120, 121, 122, 140, 150, 151, 160, 161 or 162, 165, 183, 184, and 192.

If planning to enter a Physical Therapy School with a major in Physical Education, a student should complete Physical Education 17A, 18, 55, 74, 75, 83, 106, 107, 108, 183; four credits in Sports Fundamentals, Sports Techniques, and 12 credits of approved electives. Physical Therapy students should work closely with their advisers in selecting courses to fill groups and minor requirements.

## Teaching Major

An "application for admission to Teacher Education" should ordinarily be completed before the Junior year (see "College of Education" for requirements). Approval is a prerequisite to teacher certification candidacy and to enrollment in Education and Psychology courses.

For Secondary Physical Education majors the following four-year programs are suggested.

MEN				
FRESHMAN YEAR				
Course	Credit			
	F	W	Sp	
PE 20, 21, 22	1	1	1	
PE 75	2			
PE 17A				Any Quarter
<sup>1</sup> Group Req				All Quarters
Minor				Any Quarter
English 1, 2, 3	3	3	3	
Electives				All Quarters

SOPHOMORE YEAR				
Course	Credit			
	F	W	Sp	
PE 30, 31, 32	1	1	1	
PE 74				Any Quarter
PE 83				Any Quarter
Physiology 20				3 or 3
PE 85	3			
Minor				Any Quarter
<sup>1</sup> Group Req				All Quarters
Electives				All Quarters

JUNIOR YEAR				
Course	Credit			
	F	W	Sp	
PE 120				Any Quarter
PE 121, 122	2	2	2	
PE 106, 107, 108	3	3	3	
PE 189, 188, 190	2	2	2	
PE 132				Any Quarter
Education 126, 150				Any Quarter
Psychology 100, 106				Any Quarter
Public Health 155				Any Quarter
Minor				Any Quarter
Electives				All Quarters

SENIOR YEAR				
Course	Credit			
	F	W	Sp	
PE 130, 131	2	2	2	
PE 183, 192, 184	3	3	3	
Education 127, 129, 130				Any Quarter
Minor				Any Quarter
Electives				All Quarters

WOMEN				
FRESHMAN YEAR				
Course	Credit			
	F	W	Sp	
PE 75	2	2		
PE 20, 21, 22	1	1	1	
PE 24, 26	1		1	
PE 98				1
PE 17A <sup>2</sup> , 18 <sup>2</sup>				Any Quarter
English 1, 2, 3	3	3	3	
<sup>1</sup> Group Req				All Quarters
Electives				All Quarters

SOPHOMORE YEAR				
Course	Credit			
	F	W	Sp	
PE 83	3	3	3	
PE 92, Physiology 20	3	3		
PE 77, 78, 79	1	1	1	
PE 94, 95, 96, 98	1	1	2	
PE 74				Any Quarter
<sup>1</sup> Group Req				All Quarters
Electives				All Quarters

<sup>1</sup>Recommended Group Requirement. Ex Sci: Chem 10 and Physics 6; Biol Sci 1 and Physiology 4.

<sup>2</sup>Courses taught more than one quarter each year.

**JUNIOR YEAR**

Course	Credits		
	F	W	Sp
PE 106, 107, 108 .....	3	3	3
PE 120, 121, 122, 165 .....	2	2	2
PE 132 .....	Any Quarter		
PE 150 .....	4		
Education 126 .....	Any Quarter		
Education 150 .....	Any Quarter		
Psychology 100 and 102 .....	Any Quarter		
Minor .....	All Quarters		
Electives .....	All Quarters		

**SENIOR YEAR**

Course	Credit		
	F	W	Sp
PE 160 .....			2
PE 183, 192, 184 .....	3	3	3
Pub Health 154 (or 155—4 cr) .....	Any Quarter		
Education 127 .....	Any Quarter		
Education 129 .....	Any Quarter		
Education 130 .....	Any Quarter		
Minor .....	All Quarters		
Electives .....	All Quarters		

**Elementary Physical Education  
Minor for Elementary Education  
Majors: 18 credits required.**

Required Courses	Credit
PE 81 Rhythms and Dramatic Games .....	2
or PE 111 Creative Rhythms for Schools ..	3
PE 83 Techniques in Game Leadership .....	3
PE 177 Physical Education in the Ele- mentary School .....	3
or PE 182 Materials and Methods in Elementary Physical Education .....	3
Total .....	8 or 9

**Additional credits to be selected  
from the following courses: PE  
17A, 21, 24, 31, 32, 75, 85, 92, 94,  
98, 113, 126; HE 55; RE 172.**

**Health Education Major**

**Required foundation courses (can be used as  
group fillers)**

- Physiology 4
- Bacteriology 10 or 70
- Foods and Nutrition 22
- Psychology 53
- Sociology 70 or Anthropology 90
- American Government requirement (Politi-  
cal Science 10, History 20, or Economics  
51)
- Chemistry is a recommended group filler and  
is required for advanced Physiology

An approved program of a mini-  
mum of 45 credits should be select-  
ed from the following courses:

Required courses	Credits
H Ed 55 First Aid .....	3

H Ed 135 Safety Education .....	3
H Ed 145 Alcohol and Tobacco Education ..	3
H Ed 158 Curriculum Development in Health Education .....	3
(Prerequisites: Public Health 15, H Ed 163)	
H Ed 163 Methods and Materials in Health Education .....	3
(Prerequisite: Public Health 15)	
Pub H 15 Personal Health .....	2
Pub H 150 Environmental Sanitation .....	4
Psych 145 Mental Health (Social Work 162 may be used) .....	3

**Elective courses**

A minimum of 5 credits selected  
from the following:

H Ed 117 School and Community Health Workshop .....	2
Pub H 149 Problems in Community Health .....	2
Pub H 50 Introduction to Public Health ..	3
Pub H 151 Organization and Administra- tion of Health Agencies .....	3
Pub H 157 Control of Communicable Diseases .....	2

A minimum of 10 credits select-  
ed from the following courses:

F & CD 120 Marriage .....	3
F & CD 125 Methods and Procedures in Family Life Education .....	3
Pub H 152 Family Health .....	3
PE 107 or 108 Kinesiology or Adapted Physical Education .....	3
Health Ed 136 Medical Self-Help .....	2
Psych 140 Abnormal Psychology .....	3
Psych 202 Adolescent Psychology .....	3
Zoology 112 Principles of Genetics .....	5

**Recreation Education Major**

A student may earn a Bachelor  
of Science degree with a major in  
Recreation Education. The major  
course requirements for such a de-  
gree are as follows: PE 74, 85,  
106, 120, 153, 183, RE 83, 157, 179,  
196, Theatre Arts 158, Speech  
118, Industrial Arts 90, Land-  
scape Architecture 130, Political  
Science 15; plus 4 credits from  
the following: RE 170, 171, 172,  
PE 177 or 182, PE 175, PE Sports  
Fund Courses, PE Technique  
Courses, Forestry 137, 138 or 139,  
Sociology 141, Child Development  
100 or PE 84, Business Adminis-  
tration 100.

For a minor in Recreation Edu-  
cation a student must complete:



RE 83, 179, 196, PE 183 and seven additional credits selected from those prescribed for a major in Recreation.

## Graduate Study

The department offers courses leading to the Master of Science degree in Health Education, Physical Education, or Recreation. Before admission to candidacy for the degree, a student must complete the equivalent of a Bachelor's degree in Physical Education at USU and additional requirements as prescribed by the School of Graduate Studies. See Graduate Catalog.

## Health, Physical Education and Recreation Courses

### Activity Courses for Men

1. Basic Physical Education (1F, W, Sp)	Staff
2. Freshman Football (1F)	Staff
4. Boxing (Beginning) (1F, 1W, 1Sp)	Staff
5. Boxing (Advanced) (1F, 1W, 1Sp)	Staff
6. Football (Non-Varsity) (1W)	Staff
7. Wrestling (Beginning) (1F, 1W, 1Sp)	Staff
8. Wrestling (Advanced) (1F, 1W, 1Sp)	Staff
10. Indoor Track and Field (1W)	Maughan
11. Baseball (1Sp)	Railey
12. Track (1Sp)	Maughan
15. Softball (1Sp)	Staff
16. Swimming (Beginning) (1F, 1W, 1Sp)	Staff
17. Swimming (Intermediate) (1F, 1W, 1Sp)	Staff
23. Basketball (1F, 1W, 1Sp)	Staff
27. Weight Training (1F, 1W, 1Sp)	Staff
29. Varsity Football (1F)	Staff
34. Soccer (1F)	Staff
35. Volleyball (1W)	Staff
36. Self-Defense (1W)	Staff
37. Trampoline (1F, 1Sp)	Staff
38. Tumbling and Gymnastics (1W)	Staff
64. Cross Country (1F)	Maughan

### Activity Courses for Women

1. Basic Physical Education (1F, W, Sp)	Staff
14. Track and Field (1F, 1Sp)	Staff
39. Soccer-Speedball (1F)	Staff
40. Volleyball (1F, 1W)	Staff
41. Basketball (1W)	Staff
42. Softball (1Sp)	Staff
43. Field Hockey (1Sp)	Staff
44. Tumbling and Stunts (1W, 1Sp)	Staff
52. Swimming (Beginning) (1F, 1W, 1Sp)	Staff
56. Swimming (Intermediate) (1F, 1W, 1Sp)	Staff
57. Synchronized Swimming (1F)	Staff
58. Gymnastics (Advanced) (1F, W, Sp)	Staff
60. Body Conditioning (1F, W, Sp)	Staff

### Activity Courses for Men and Women

3. Skiing (Beginning) (1W)	Staff
9. Fencing (1F, 1W, 1Sp)	Downs
13. Bowling (1F, 1W, 1Sp)	Staff
18. Swimming (Advanced) (1F, 1W, 1Sp)	Staff
19. Skiing (Intermediate) (1W)	Staff
28. Diving (Prerequisite: PE MW 18) (1Sp)	Staff
33. Skiing (Advanced) (1W)	Staff
45, 46, 47. Adapted Physical Education. Designed to meet the needs of individuals who are unable to participate in the required program of Physical Education. Students must obtain permission from the Head of the Department before registering. (1F, 1W, 1Sp)	
	D. Nelson
48. Modern Dance (Beginning) (1F, 1W, 1Sp)	Fullmer
49. Modern Dance (Intermediate) (1W, 1Sp)	Fullmer
51. Modern Dance (Advanced) (1W, 1Sp)	Fullmer
53. Square Dancing (1F, 1W, 1Sp)	Burnett
61. Archery (Beginning) (1F, 1W, 1Sp)	Staff
62. Archery (Advanced) (1W, 1Sp)	Staff
66. Badminton (Beginning) (1F, 1W, 1Sp)	Staff
67. Tennis (Beginning) (1F, 1Sp)	Staff
68. Folk Dance (Beginning) (1F, 1W)	Fuller
69. Badminton (Advanced) (1F, 1W, 1Sp)	Downs
70. Tap Dancing (Beginning) (1F, 1W, 1Sp)	Fuller

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71. **Tap Dancing** (Intermediate) (1F, 1W) **Fuller**  
 72. **Social Dancing** (Beginning) (1F, 1W, 1Sp) **Fuller**  
 73. **Golf** (Beginning) (1F, 1Sp) **Staff**  
 74. **Life Saving**. Prerequisites: Red Cross Swimmers Card or permission of instructor. American Red Cross Certificate is given to students who pass the examination. (2F, 2W) **Rasmussen**  
 76. **Social Dance** (Advanced) (1F, 1Sp) **Staff**  
 88. **Golf** (Advanced) (1Sp) **Staff**  
 90. **Tennis** (Intermediate) (1Sp) **Staff**

### Professional Courses in Physical Education

- 17A. **Swimming**. For Freshmen and transfer students majoring in Physical Education. (1F, 1W) **Rasmussen**  
 20. **Fundamentals of Sports**. Designed to develop the fundamental skills of tennis and archery. (1F, 1Sp) **Staff**  
 21. **Fundamentals of Sports**. Designed to develop the fundamental skills of social and square dancing. (1F, 1W) **Staff**  
 22. **Fundamentals of Sports**. Designed to develop the fundamental skills of badminton and golf. (1F, 1Sp) **Staff**  
 24. **Dance Laboratory**. Folk and tap dancing for Freshman and Sophomore women majoring or minoring in Physical Education. (1F) **Fullmer**  
 26. **Dance Laboratory**. Tap dancing for Freshman and Sophomore women majoring or minoring in Physical Education. (1Sp) **Fuller**  
 30. **Fundamentals of Sports**. Designed to develop the fundamental skills of boxing, weight training and wrestling. (1W, 1Sp) **Staff**  
 31. **Fundamentals of Sports**. Designed to develop fundamental skills of tumbling, gymnastics and trampoline. (1F, 1W) **Staff**  
 32. **Fundamentals of Sports**. Designed to develop the fundamental skills of volleyball and speedball. (1F, 1W) **Staff**  
 75. **Introduction to Physical Education**. An introduction to the history, philosophy, theory and practice of Physical Education. (2F, 2W) **McClellan**  
 77. **Dance Laboratory**. Techniques of elementary modern dance for Freshman and Sophomore women majoring or minoring in Physical Education. (1F) **Fullmer**  
 78. **Dance Laboratory**. Techniques of intermediate modern dance for Freshman and Sophomore women majoring or minoring in Physical Education. (1W) **Fullmer**  
 79. **Dance Laboratory**. Techniques of advanced modern dance for Freshman and Sophomore women majoring or minoring in Physical Education. (1Sp) **Fullmer**  
 81. **Rhythms and Dramatic Games**. Rhythms for young children; its use in creative movement. Methods of presenting and developing rhythms are studied. (2F) **Fuller**  
 85. **Organization of Intramural Sports**. Organization and administration of intramural sports in secondary schools. Sports, tournaments, units of competition, scoring systems, and coordination of intramural sports with Physical Education and Athletics. (3F, 3W) **Mendini**  
 86. **Sports Officiating for Men**. Knowledge of the rules and mechanics of officiating football, touch football, basketball, wrestling and boxing. Attention is also given to the proper instruction of other game officials such as timers, scorers and game administrators. (2F) **Mendini**  
 87. **Sports Officiating for Men**. Knowledge of the rules and mechanics of officiating volleyball, ski meets, water basketball, badminton and softball. The techniques of officiating basketball are reviewed. Attention is also given to the proper instruction of other game officials such as timers, scorers and game administrators. (2W) **Mendini**  
 92. **Organization of Intramural Programs for Women**. Organization of sports days, play days, tournaments, and administration of intramural activities for women. (3W) **Downs**  
 93. **Sports Officiating for Women**. Techniques of officiating, knowledge of rules, and practical experience in officiating. (2F, 2W) **Pearce**  
 94. **Physical Education Laboratory**. For lower division women, designed to develop the fundamental skills of soccer-speedball and volleyball. (1F) **Downs**  
 95. **Physical Education Laboratory**. For lower division women, designed to develop the fundamental skills of basketball and basketball officiating. (1W) **Pearce**  
 96. **Physical Education Laboratory**. A professional course for lower division women designed to develop the fundamental skills of softball and field hockey. (1Sp) **Downs**  
 98. **Physical Education Laboratory**. Fundamentals of individual sports for lower division women majoring or minoring in Physical Education. (1Sp) **Downs**  
 102. **Dance Composition**. Composition based upon the elements of direction, level, and dimension. Experience in individual and group composing. (2F) **Fullmer**  
 103. **Composition in Modern Dance**. Composition based upon the following musical forms: AB, rondo, theme and variation, canon and round, dance suite. (2Sp) **Fullmer**

**104. Dance Production.** Composition done independently. Participation in a performance required. Lighting, staging, costume and make-up applied to a dance concert. (2W)  
**Fullmer**

**106. Kinesiology.** The science of movement. Includes a study of the structure of the human body in terms of its use in activity; a mechanical analysis of all types of activity based upon principles of good body mechanics; methods of developing and using the human body. Prerequisite: Physiology 20. (3W, 3Sp)  
**D. Nelson**

**107. Physiology of Muscular Activity.** A study of the physiological functions of the human body in various types of activity. The course includes a detailed study of the physiological changes that occur during all kinds of activity. Physiological functions of the human body in various types of activity. Physiological principles are then applied to Physical Education. Prerequisite: Physiology 4. (3F, W)  
**D. Nelson**

**108. Adapted Physical Education.** Basically a study of the adapted Physical Education program. Includes the administration of an adapted Physical Education program. Also a study of abnormal problems in body mechanics, athletic injuries and their treatment, athletic training procedures, and principles dealing with abnormal conditions found in the physical education program. Prerequisite: Physiology 20. (3F, 3Sp)  
**D. Nelson**

**111. Creative Rhythms for Schools.** Methods and materials used in guiding creative rhythmic experiences of students. Material applicable to elementary or secondary school. (3W)  
**Fuller**

**113. Construction of Physical Education Equipment.** Construction of and practice in the use of rhythmic instruments and play equipment. (3Sp)  
**Downs**

**116. Techniques in Teaching Skiing.** A professional course designed to develop teaching techniques in skiing using the American ski techniques, methodology and theory. (2F)  
**Staff**

**120. Methods in Physical Education.** Student assists in teaching the service program under direction of a staff member. He begins his first practical training in teacher preparation. Classroom consists of methods and techniques of teaching physical education and relates directly to the assistant teaching program. Prerequisites: PE 20, 21, 22, 30, 31, 32. (3F, 3W, 3Sp)  
**Downs**

**121. Techniques in Physical Education.** Designed to develop teaching techniques in Social and Square Dance. Open to men and women. Prerequisite: PE 120. (2W, 2F)  
**Staff**

**122. Techniques in Physical Education.** Designed to develop teaching techniques in tennis and badminton. Open to men and women. Prerequisite: PE 120. (2F, 2Sp)  
**Staff**

**126. Physical Education for Teachers of the Mentally Retarded.** The course is a general physical education teacher training program adapted to the mentally retarded student. The material is designed for those students preparing to teach mentally retarded people. (3F, W, Sp)  
**Downs**

**130. Techniques in Physical Education.** Designed to develop teaching techniques in volleyball, speedball and wrestling. Prerequisite: PE 120. (2F) Seniors only. (2Sp) Juniors only.  
**Staff**

**131. Techniques in Physical Education.** Designed to develop teaching techniques in gymnastics, tumbling and trampoline. Prerequisite: PE 120. (2W, 2Sp)  
**Staff**

**132. Water Safety Instructor's Course.** Prerequisites: American Red Cross Senior Life-saving certificate and permission of the instructor. Attention is given methods of teaching swimming, diving, lifesaving and use of small water crafts. American Red Cross certification is given students who pass the exam. (2W, 2Sp)  
**Rasmussen**

**140. Dance History.** A history of dance from the primitive through Greek, medieval and renaissance periods into the theatrical dance forms: ballet and modern. (3W)  
**Fuller**

**150. Methods in Dance.** The place of various types of dance in the Physical Education program. Emphasis given methods of teaching these activities and practice in teaching class members. (2Sp)  
**Fullmer**

**151. Techniques of Dance.** Techniques of a variety of dance types, with emphasis on ballet and modern. (2Sp)  
**Staff**

**153. Leadership in Dance.** An advanced class in dance leadership to meet needs of students who expect to teach social or square dancing in schools or churches. Prerequisite: one quarter of social or square dancing. A syllabus is required. (2Sp)  
**Staff**

**160. Techniques of Team Sports for Women.** Designed to develop teaching techniques in soccer, speedball, basketball, softball, field hockey and volleyball. (3F, Sp)  
**Pearce**

**165. Techniques in Physical Education for Women.** Designed to develop teaching techniques in tumbling and gymnastics. (2F, 2Sp)  
**Staff**

**177. Physical Education in the Elementary School.** Designed to give a philosophy of Physical Education in the elementary school. Emphasis is on program planning, teaching techniques, the direction and participation in elementary Physical Education activities and the selection of activities that will help satisfy the needs of the elementary school child. (3F, 3W)  
**Downs**

**182. Materials and Methods in Elementary Physical Education.** Designed to gain an understanding of the elementary school Physical Education program. Curriculum, facilities, equipment, and the teaching of activities are emphasized. Emphasis is also placed on activities as specified in the Utah State Course of Study for the elementary school. (3Sp)

**Downs**

**183. Interpretation of Physical Education Objectives.** Results and values of Physical Education activities in terms of development, adjustment and standards. (3F, 3W)

**Hunsaker**

**184. Administration of Physical Education.** Administration procedures in Physical Education in the high school; curriculum and program planning. (3W, 3Sp)

**Hunsaker**

**188. Methods in Football.** Fundamentals of football, theory and practice; details of each position on the team; training and managing; complete technique of developing offensive and defensive tactics. Prerequisite: PE 120. (2W)

**Maughan**

**189. Methods in Basketball.** Coaching and training of basketball teams; emphasis on the psychology of the game; methods of defense and offense. Prerequisite: PE 120. (2F)

**Andersen**

**190. Methods in Track.** Fundamentals in track and field training, and the conduct of athletic meets. Prerequisite: PE 120. (2Sp)

**Maughan**

**191. Methods in Baseball.** Fundamentals of baseball, team play, training and strategy. (2W)

**Staff**

**192. Tests and Measurements in Physical Education.** Practical studies of tests and techniques of test construction. (3F, 3W)

**Hunsaker**

## Professional Courses in Recreation Education

**83. Techniques in Game Leadership.** Lectures and practical work. Lectures on selection of suitable material and methods of handling various groups. (3F, 3W, 3Sp)

**Burnett**

**123. Cub Leaders Training Course.** A course designed to prepare well qualified leaders in cub scouting, and to prepare professional scout leaders in this phase of scouting. (2Su)

**Mendini**

**124. Scoutmaster's Basic Training Experience.** The standard training course approved by the National BSA Council and includes the following: plans and methods in organization and leadership, program planning, meetings, hiking, and camping. (2Sp)

**Mendini**

**157. Field Work in Recreation.** Practical experience in conducting social recreational activities, such as for church, school and civic groups. Prerequisite: PE 83. Credit arranged. (Sp, Su)

**Burnett**

**170. Playground and Camp Organization and Administration.** Designed for people working in municipal recreation. Helps them organize and conduct playground activities and day camp programs. Deals with the problems of administration of people, programs, and facilities in a recreational setting. (3F)

**Boyce**

**171. Programming in Recreation Therapy.** A study of physical and social implications and needs of individuals in hospitals and rest homes. Designing special programs to fill these needs using all available special methods and feasible activities. (3F)

**Burnett**

**172. Recreation Areas and Facilities.** A study of the basic planning procedures, techniques, and methods for community recreation and school physical education facilities. (3W)

**Boyce**

**175. Winter Survival and Recreation.** Lectures and field trips to teach students ways of living in the wilderness under adverse weather conditions and how to participate and enjoy outdoor winter sports. Students must provide adequate clothing for field trips. (3W)

**Burnett**

**179. Camping and Camp Craft.** Training in camp techniques and camp leadership. Different types of camps and their organization, supervision, equipment and safety. Several short hikes and an overnight camp are conducted during the course. (2Sp)

**Boyce**

**196. Organization of Recreation.** Problems of organization and administration of community recreation departments, including staff, facilities, program of activities, and office management. Problems of recreation surveys, legislation, property acquisition, finances, construction and maintenance, and securing community and school co-operation in a united recreational program. (3Sp)

**Burnett**

## Professional Courses in Health Education

**55. Safety and First Aid Instruction.** Standard and Advanced American National Red Cross courses in first aid, with emphasis on practical use of the knowledge in various occupations. Detailed demonstrations and practice. American Red Cross first aid certificates may be obtained by students who pass a satisfactory examination. (3F, 3W, 3Sp)

**Mendini**

**109. Problems of Body Conditioning.** Deals with problems of weight control, body mechanics, posture and general body conditioning. It is approached through lecture, special exercises and various recreational sports. (2F, 2Sp)

**D. Nelson**

**135. Safety Education.** 1) The needs for safety education; 2) the role of the school in a program for safety; 3) methods and materials for teaching, discussions, and readings, stressing various aspects of safety in many areas. (3W, 3Sp)

**Fuller, Staff**

**136. Medical Self-Help.** Course designed to provide information and training that will help prepare students for survival in time of national disaster when services of a physician or other allied health personnel are not available. Radioactive fallout and shelter, healthful living in emergencies, care of sick and injured, as well as standard first aid procedures will be covered. (2F, W, Sp)

Mendini

**145. Alcoholism and Education.** The alcohol problem is considered from the physiological, psychological, sociological, educational, historical, and legal aspects. The development of a correlated attack on the problem is emphasized. (3Sp)

D. Nelson

**154. First Aid Instructors Course.** Prerequisite: American Red Cross advanced first aid certificate. Attention is given to methods of teaching first aid. Detailed demonstration and practice is given. American Red Cross first aid certificate is given to students who pass the examination. (2Sp)

Mendini, Staff

**158. Curriculum Development in Health Education.** Topics: the scope and socio-scientific basis for health education; organization for health education development; emphasis on the scheduling and sequence of health instruction in primary grades, intermediate grades, junior high school, high school, and health education in college; and, evaluation of outcome. Prerequisite: HE 163. (3)

**163. Methods and Materials in Health Education.** The nature of Health Education in the school and community; the health needs of the school child; the health education curriculum; methodology in the teaching of health; the resource materials of health education; and the measurement and evaluation of the total health program. Prerequisite: PH 15. (3)

Pearce

**191. Interpretation of the Health Examination.** Examination procedures, the detection of physical defects, the general assessment of the health of the individual, and the follow-up program. (3Sp)

Staff

## Graduate Courses in Physical Education

**206. Analysis of Sports Performance.** A mechanical and physiological analysis of all

types of sports performance based upon principles of movement and body mechanics. Advanced methods of developing and using the human body are emphasized. The course includes slow motion photography, physiological bases and actual performance for employing the analysis. (3)

D. Nelson

**207. Problems in Physiology of Exercise.** (3Sp, Su)

D. Nelson

**250. Reading and Conference.** Provides for individually directed study. Credit arranged.

Staff

**271. Research and Thesis Writing.** Credit arranged.

Staff

**275. Philosophical Basis of PE.** A study of the divergent origins, conditions, leaders, and forces giving rise to current basic beliefs about Health, Physical Education and Recreation. Development of individual professional philosophies. (3F)

McClellan

**282. Curriculum in Physical Education.** A course dealing with the objectives and needs of the elementary, junior and senior high Physical Education students. The various sports and activities of Physical Education will be studied and evaluated to determine their potential in developing the needs of students at each age and area level. Current practices, problems and curriculum trends will be studied. (3W, Sp)

McClellan

**294. Research and Evaluation in Physical Education.** Methods, techniques, purposes and interpretation of various kinds of research. Practical application in the conduct of a research project is utilized during the class. (3F, 3Sp)

D. Nelson

**295. Problems in Physical Education.** Various selected problems in Physical Education are studied through the use of literature and discussion as they apply to the individual and the group. Individual problems are emphasized. (3F, 3Sp)

Hunsaker

**299. Physical Education Seminar.** The group is offered the opportunity of investigating selected bodies of knowledge in Physical Education and discussion materials grow from the depth of investigation. Credit arranged. (W)

Hunsaker



Department of

## Instructional Media and Library Science

**Head:** Associate Professor Lester C. Essig, Jr.  
Office in Library 226

**Professor** Eldon Drake; **Associate Professors** Ida-Marie Logan,<sup>1</sup> Don C. Smellie, R. Kent Wood; **Assistant Professors** Leon Beutler, D. LaMont Chappell, Kathryn C. Gardner, Anna Marie Smith, Mark Sorensen;<sup>1</sup> **Instructors** LaDell Hoth, Karlo Mustonen; **Lecturer** Moana K. Young.

**Degrees:** Master of Education (MEd)

**Majors:** Instructional Media Center Specialist.

Associated with the College of Education and the University Library is the Department of Instructional Media and Library Science. The teaching staff includes ten professional college librarians, as well as a fulltime chairman of the department. This arrangement effectively bridges the gap that sometimes arises between the teaching of the theory and the practice of librarianship.

The curriculum in Library Science prepares students for positions in school, public and university libraries. Persons planning careers in school librarianship may pursue study in meeting certification requirements for teaching as well as completing the required courses for librarianship. Library Science may also be taken as a minor area of concentration at the Master's degree level or as a minor with any subject area for the Bachelor's degree.

A student may choose to meet dual certification requirements in Education and Library Science for service in both elementary and secondary schools. Cooperating public and school librarians provide ample opportunities for field

work through library practice and student teaching.

The American Library Association estimates there are 25,000 vacancies in the profession. New library programs being created at all levels of education for schools, colleges, and communities provide ample fields for exciting careers at all levels of librarianship.

### Instructional Communication Minor

Instructional Communication (Audiovisual) is the application of message design, instructional technology, and systems development to the teaching-learning process. This program is designed to help persons planning teaching careers to become knowledgeable in the latest educational methods, systems, and technology; and, to help them become designers and creators of educational experiences. Those who complete the undergraduate minor program for the Bachelor degree and for either elementary or secondary teacher certification, will be well qualified for the position of Audiovisual Coordinator of a school. The minor will also serve as a good basis for further professional training for graduate work.

The following program meets

<sup>1</sup>These persons who teach in Library Science are regular library staff members holding professorial rank.

the minor requirements for students working toward a Bachelor's degree and Elementary Teacher Certification.

**Instructional Communication (A-V)  
Undergraduate Elementary  
Minor—21 credits**

Required Courses:	Credits
IMLS 121 Cataloging and Classification ..	3
IMLS 155 Utilization of Audiovisual Media	3
IMLS 156 Instructional Media in Education	3
IMLS 165 Production of Audiovisual Materials .....	3
IMLS 166 Local Production of Audiovisual Materials .....	3
IMLS 181 Developing the School Audio- visual Program .....	3
Spch 184 Educational Broadcasting .....	3
<b>Total .....</b>	<b>21</b>

**Recommended Course:**

Art 57 Photo Fundamentals .....	3
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The following program meets the minor requirements for students working toward a Bachelor's degree and Secondary Teaching Certification:

**Instructional Communications (A-V)  
Undergraduate Secondary  
Minor—24 credits**

Required Courses:	Credits
IMLS 121 Cataloging and Classification ..	3
IMLS 155 Utilization of Audiovisual Media	3
IMLS 156 Instructional Media in Education	3
IMLS 165 Production of Audiovisual Materials .....	3
IMLS 166 Local Production of Audiovisual Materials .....	3
IMLS 181 Developing the School's Audiovisual Program .....	3
Spch 184 Educational Broadcasting .....	3
Art 57 Photo Fundamentals .....	3
<b>Total .....</b>	<b>24</b>

## Library Science Minor

The program in Library Science is designed to prepare persons for positions in school, public and university libraries. Library Science may be used as a minor in connection with a major in any subject.

Persons planning careers in school librarianship must meet teacher certification requirements in addition to completing required courses in library science. A per-

son can meet the certification requirements in elementary and secondary education, as well as in librarianship.

The following program meets the minor requirements for students working toward a Bachelor's degree and Elementary Teacher Certification:

**Library Science Undergraduate Elementary  
Minor—21 credits**

Required Courses:	Credits
IMLS 101 Library Reference Services .....	3
IMLS 111 Book Selection .....	3
IMLS 112 Reading Guidance .....	3
IMLS 121 Cataloging & Classification .....	3
IMLS 132 Elementary School Library Administration .....	3
IMLS 136 History of Books & Libraries ..	3
English 122 Children's Literature .....	3
<b>Total .....</b>	<b>21</b>

**Elective Courses (3-5 credits recommended):**

106 Public Documents .....	3
Speech 118 Story Telling .....	5
<sup>1</sup> IMLS 155 Utilization of Audiovisual Materials .....	3
<sup>1</sup> IMLS 165 Production of Audiovisual Materials .....	3

The following program meets the minor requirements for students working toward a Bachelor's degree and Secondary Teacher Certification:

**Library Science Undergraduate Secondary  
Minor—24 credits**

Required Courses:	Credits
IMLS 101 Library Reference Services .....	3
IMLS 111 Book Selection .....	3
IMLS 112 Reading Guidance .....	3
IMLS 121 Cataloging and Classification ....	3
IMLS 133 Secondary School Library Administration .....	3
IMLS 136 History of Books and Libraries	3
English 123 Literature for Adolescents .....	3
<b>Total .....</b>	<b>21</b>

**Elective Courses (3 credits required):**

IMLS 106 Public Documents .....	3
IMLS 135 Library Practice .....	3
Speech 118 Story Telling .....	5
<sup>1</sup> IMLS 155 Utilization of Audiovisual Materials .....	3
<sup>1</sup> IMLS 165 Production of Audiovisual Materials .....	3

<sup>1</sup>Students planning to certify as school librarians in Utah must elect to take one of the audiovisual courses.

## Instructional Media Center

The Instructional Media Center program is a combination of Library Science and Instructional Communication. The Instructional Media Center concept is the application of Library Science to all educational materials.

Divisions of the American Library Association and the National Education Association prepared a joint statement concerning the role of librarians in the Instructional Media Centers. This statement became a part of the American Library Association Standards for School Library Programs in 1960.

In recent years, many new types of instructional media and equipment have been developed, such as educational television programs, specialized training devices and new projection materials. At the same time, more familiar media such as books, films, and recordings have been made increasingly effective through modern techniques of illustration, improved design, and new production processes.

Because of the broad variety of media now available and the rapid increase of production within each medium, teachers are faced with a vast reservoir of instructional materials from which to choose. This means that teachers require more and more help from specialists to locate, evaluate, select, produce and use instructional media to best advantage. In order to provide such help, specialists need to have a working knowledge of the entire range of media, the potential contributions each can make to learning, and effective methods to use.

The Master of Education program is designed to prepare these needed specialists for positions in libraries which have already con-

verted into the new and broader Instructional Media Center or to help the traditional library make this transition as community and educational needs require.

The following program meets the requirements for a Master of Education Degree:

**Instructional Materials Center Master of Education**, for students new to the field of Instructional Materials and Library Science, with no previous work in the department.

Required Courses:	Credits
IMLS 181 Developing the School's Audiovisual Program .....	3
IMLS 155 Utilization of Audiovisual Media .....	3
IMLS 165 Production of Audiovisual Materials .....	3
IMLS 166 Local Production of Audiovisual Materials .....	3
Spch 184 Educational Broadcasting .....	3
IMLS 132 Elementary School Library Administration .....	3
or	
IMLS 133 Secondary School Library Administration (3) .....	
IMLS 101 Library Reference Services .....	3
IMLS 111 Book Selection .....	3
IMLS 121 Cataloging and Classification .....	3
IMLS 136 History of Books and Libraries .....	3
Engl 122 Children's Literature .....	3
or	
Engl 123 Literature for Adolescents (3) .....	
IMLS 251 Evaluation and Selection of Instructional Materials .....	3
IMLS 191 Instructional Media Communication Theory .....	3
IMLS 135 Library Practice (or professional experience) .....	(3)
IMLS 201 Specialized Library Reference Materials .....	3
IMLS 225 Computer and Machine Application in Library Science .....	3
Educ 204 Elementary School Curriculum ..	3
or	
Educ 230 Secondary School Curriculum (3) ..	
Educ 164 Measurement and Evaluation in Education .....	3
Educ 266 Introduction to Research in Education .....	3
Educ 285 Research and Thesis Writing .....	3
Educ 264 Instructional Leadership in Education .....	3
Total .....	60 (63)

**Instructional Materials Center Master of Education**, for those students who were undergraduate minors in Instructional Communication in the department.

Required Courses:	Credits
IMLS 132 Elementary School Library Administration .....	3
or	
IMLS 133 Secondary School Library Administration (3) .....	3
IMLS 101 Library Reference Services .....	3
IMLS 111 Book Selection .....	3
IMLS 112 Reading Guidance .....	3
Engl 122 Children's Literature .....	3
or	
Engl 123 Literature for Adolescents (3) ....	3
IMLS 136 History of Books and Libraries .....	3
IMLS 191 Instructional Media Communication Theory .....	3
IMLS 251 Evaluation and Selection of Instructional Materials .....	3
Spch 181 Developing the School's Audiovisual Program .....	3
IMLS 135 Library Practice (or professional experience) .....	(3)
IMLS 201 Specialized Library Reference Materials .....	3
IMLS 225 Computer and Machine Application in Library Science .....	3
Ed 204 Elementary School Curriculum ....	3
or	
Sec Ed 230 Secondary School Curriculum (3) .....	3
Sec Ed 164 Measurement and Evaluation in Education .....	3
Ed Adm 266 Introduction to Research in Education .....	3
Ed 285 Research and Thesis Writing .....	3
Ed Adm 264 Instructional Leadership in Education .....	3
Total .....	48 (51)

**Instructional Materials Center Master of Education**, for those students who were undergraduate Library Science minors in the department.

Required Courses:	Credits
IMLS 181 Developing the School's Audiovisual Program .....	3
IMLS 155 Utilization of Audiovisual Media .....	3
IMLS 156 Instructional Media in Education .....	3
IMLS 166 Local Production of Audiovisual Materials .....	3
Spch 184 Educational Broadcasting .....	3
Art 57 Photo Fundamentals .....	3
IMLS 251 Evaluation and Selection of Instructional Materials .....	3
IMLS 191 Instructional Media Communication Theory .....	3
Spch 181 Television Production .....	3
IMLS 135 Library Practice (or professional experience) .....	(3)
IMLS 201 Specialized Library Reference Materials .....	3
IMLS 225 Computer and Machine Application in Library Science .....	3
Ed 204 Elementary School Curriculum ..	3
or	

Educ 230 Secondary School Curriculum (3)	
Educ 164 Measurement and Evaluation in Education .....	3
Educ 266 Introduction to Research in Education .....	3
Educ 285 Research and Thesis Writing ....	3
Educ 264 Instructional Leadership in Education .....	3
Total .....	48 (51)

## Instructional Media & Library Science Courses

**50. Use of Libraries & Library Materials.** A study of the essential reference work sources in general subject areas. Includes the uses of dictionaries, encyclopedia, yearbooks, handbooks, periodical indexes, and the more important subject and trade bibliographies. (3F, W, Sp, Su) **Gardner, Wood**

**101. Library Reference Services.** Builds a knowledge of the scope, significant characteristics, principles and philosophy of information retrieval and bibliographic techniques. Each student is given the opportunity to explore the literature and important reference tools augmenting the major disciplines. (3Sp, Su) **Logan, Wood**

**106. Public Documents.** The study of bibliographies, catalogs, indexes, and other sources which are the keys in using public documents. Federal, state, and United Nations documents, which constitute vast sources of knowledge will be introduced. (3Sp) **Mustonen**

**111. Book Selection.** Presents general principles of selection, specific criteria for the selection of books, magazines, and related material for school and public libraries. Studies the use of standard book selection aids and book reviewing publications. (3Sp, Su) **Hoth, Sorensen, Wood**

**112. Reading Guidance.** Consideration is given to the needs of librarians and other persons concerned with reading programs in school and public libraries. Special problems and interests related to library work with children, young adults and adults are treated. Case studies dealing with reading programs and assistance to readers are emphasized. (3F, Sp) **Gardner, Wood, Staff**

**121. Cataloging and Classification.** Fundamental methods and techniques of simplified cataloging and classification. Library processing of books, near and non-book materials are covered. Basic rules of entry, descriptive cataloging, filing, and the Dewey Decimal Classification System are stressed. (3F, Su) **Drake, Gardner, Hoth, Wood**

**132. Elementary School Library Administration.** Consideration is given to the administration and organization of elementary school libraries. The philosophy, scope of services,

curriculum enrichment, special reference problems, and auxiliary programs are covered with special attention given to student assistant programs and community relations. Children's services of public libraries are included. (3W, Su) **Chappell, Gardner, Hoth, Wood**

**133. Secondary School Library Administration.** A study of practices in secondary school libraries and an introduction into organization of the several types of libraries and techniques of administration of libraries generally. The philosophy and scope of services, relationship to school curriculum, and library planning for secondary schools is stressed. The expanded services and the development of the Instructional Materials Center concept is given attention. (3W, Su)

**Chappell, Gardner, Hoth, Wood**

**135. Library Practice.** Observation and supervised practice under the direction of library personnel. Designed to give the student practical experience in the various types of libraries and to bridge the gap between classroom theory and practice in the field. 90 clock hours of fieldwork, including a weekly conference with the supervisor are offered. Prerequisites: IMLS 101, 111, 121, and 132 or 133. (3F, W, Sp, Su) **Gardner, Smith, Wood**

**136. History of Books and Libraries.** The history of bookmaking, printing, and libraries. (3W, Su) **Gardner, Wood**

**139. Readings and Conference.** Provides for individually directed study. Limited to Library Science Minors. Prerequisite: Instructor's consent. Credit arranged. (F, W, Sp, Su) **Staff**

**155. Utilization of Audiovisual Media.** A basic course designed to give a broad overview of audiovisual materials and equipment and their contributions in improving the educational experiences of the learner. Studies and compares the advantages and limitations of the major types of instructional media with training in the selection operation and proper utilization of educational equipment and materials, with some practice in the design and preparation of more easily teacher-made materials. **Staff**

**156. Instructional Media in Education.** Reviews the structure and utilization of the newer media and instructional systems in education, and applies basic concepts of communication to problems in teaching and learning. Prerequisite: IMLS 155 or 151 with instructor's permission. (3Sp) **Essig**

**165. Production of Audiovisual Materials.** Acquaints those in the educational field with the possibilities of creating instructional materials to meet their own professional needs. Teaches basic techniques for the production of a wide variety of both opaque and transparent visuals for display, study, and projection purposes. (3F, W, Sp, Su) **Smellie**

**166. Local Production of Audiovisual Materials.** Advanced skills are taught in the four production areas: illustration, mounting and preservation, lettering, and coloring. Training in message design is provided through the creation of instructional materials to be used in the student's own teaching area. Prerequisite: IMLS 165. (3W, Su) **Smellie**

**181. Developing the School's Audiovisual Program.** The steps in initiating and administering an audiovisual program for a single school are considered. Included are the study of organization, personnel, budgets, selection and circulation of materials and equipment, providing for a wide variety of audiovisual services, and the planning for building and classroom facilities to effectively utilize instructional materials. Prerequisite: IMLS 151 or 155 with instructor's permission. (3W)

**Essig**

**191. Instructional Media Communication Theory.** Considers research and theory applicable to the classroom and to the teaching-learning process. Communication models will be studied, and consideration given to communication barriers, the influence of perception on learning, strength and weaknesses of pictorial and verbal modes of representation, techniques and methods of teaching motor skills, concept development and attitude formation. Prerequisites: IMLS 155 and 156 or instructor's permission. (3Sp) **Essig**

**201. Specialized Library Reference Materials.** A course designed for librarians to build a knowledge in depth of specialized reference materials. A sequential course to IMLS 101 emphasizing materials and problems unique to the larger, more extensive libraries. Prerequisite: IMLS 101. (3F) **Logan, Wood**

**225. Computer and Machine Application in Library Science.** An overview of development, experimentation, and research in the automation of libraries including storage, retrieval, and application to acquisitions, serials control, circulation management and related technical library services. (3Sp, Su) **Chappell**

**238. Workshop in Librarianship.** Designed for teachers, librarians, and administrators to study the current needs of libraries in schools and communities in relation to the problems of education and the institutions served. Resources and organization of new media, development techniques for implementation of the instructional materials center concept, as well as a review of the new books, magazines and related materials will be stressed. (2Su) **Wood and Visiting Staff**

**251. Evaluation and Selection of Instructional Materials.** Training and practical experience is given in the evaluation and the selection of a variety of Instructional Materials. Prerequisite: IMLS 155, or instructor's permission. (3F) **Essig**



Department of

# Psychology

**Acting Head:** Professor Heber C. Sharp  
Office in Education 309

**Professors** Arden N. Frandsen, James Shaver, David R. Stone, E. Wayne Wright; **Associate Professors** Marvin F. Daley, Glendon Casto; **Assistant Professors** J. Whorton Allen, Keith Checketts, John Cragun, Charles Hall, Ronald Peterson, Robert Publicover.

**Degrees:** Bachelor of Science (BS), Master of Education (MEd), Master of Science (MS), Doctor of Education (EdD), Doctor of Philosophy (PhD).

**Major:** Psychology (A broad range of emphases is available at the under graduate level.)

Psychology is one of many areas of science concerned with the study of behavior. Psychologists utilize strict rules of science in order to make more accurate statements concerning the behavior of man. Animals in psychology are studied under laboratory conditions in attempts to isolate specific reactions to stress, overcrowding, sensory deprivation and stimulation, satiation, and countless other situations. Many sound principles of psychology have been developed through the use of laboratory animals.

Psychologists are working in every area of human endeavor. General fields include Research, Teaching, Industry, Human Engineering, Clinics and Mental Hospitals, Aerospace agencies, and Armed Forces. They share their findings through an extensive array of professional journals and books. Students interested in the scientific study of behavior through psychology will find considerable satisfaction in this field. One should not look to psychology as a singular approach to man's behavior. Companion majors or minors with psychology are anthropology, sociology, physiology, mathematics, philosophy, business,

and chemistry or physics. The nature of the course of study to be followed depends on the student's primary interests.

The Department of Psychology has arrangements with schools, social welfare agencies, juvenile courts, the Wyoming State Mental Hospital, and the State Industrial School, by which graduate students and some Seniors can have practical experience in counseling and clinical psychology.

## Undergraduate Study Lower Division

The best preparation for psychology is basic training in physical and biological science, social science, mathematics, and literature. In completing the group requirements, it is recommended that the following courses be included: Physiology 4, History 20 or Political Science 10, Sociology 70; English Literature (novel and biography) courses; Physics 6, 17, 19 or 21; Mathematics 34, 35 and additional mathematics courses if the student is interested in this subject.

The minimum of 43 credits in the "general education requirements" might well be exceeded.

## Upper Division

**Requirements for a major in psychology** include 45 credits and course work must include: Psychology 53, 71, 100, 112, 127, 140, 161, 171, 175, and 181; and the balance of 11 credits from courses in psychology approved by the student's adviser. Recommended upper division electives: Anthropology 90; Sociology 171; Education 186; Speech 110; Zoology 112, 119; Physiology 104 or 121, 122; the Education courses for teacher certification; Social Work 170; and upper division courses in literature. Undergraduate students are urged to take courses for a strong minor rather than to overemphasize psychology courses.

**A Minor in Psychology** should include Psychology 53, 71, 100, 112, and six credits from the following: Psychology 127, 140, 161, 171, 172, 175, and 181.

## Graduate Study

**Master of Science Degree in Psychology.** Providing for specialization at the Master's degree level, the Utah State University Department of Psychology (and Guidance) offers the Master of Science and Master of Arts degrees in ten areas: 1) General, 2) Developmental, 3) Educational, 4) School Psychologist, 5) Counseling, 6) Animal Behavior, 7) Physiological Psychology, 8) Experimental, 9) Social Psychology, and 10) Learning and Motivation.

**Master's Degree in Counseling.** Three types of degrees are presently available: 1) AMS degree in Psychology, with a major emphasis in counseling, 2) AMS degree in Counseling Psychology, and 3) AMEd in Counseling and Guidance. The essential differ-

ence in these three tracks is in the amount of undergraduate course work in psychology. Essentially, the **MS in Psychology** requires a Bachelor's degree, or 45-credits of undergraduate psychology; the **MS in Counseling Psychology** requires only 30 credits of undergraduate Psychology, with the remainder of undergraduate prerequisites allowable in education and/or other disciplines; and the **MEd in Counseling and Guidance** requires a teacher's certificate and not fewer than 17 credits of undergraduate Psychology, with the remainder of undergraduate prerequisites being allowed in education and/or other disciplines. Students entering graduate training in counseling are advised into the particular program track which seems most appropriate in terms of their previous training, as well as their present and anticipated interests for a greater emphasis either in educational counseling and guidance, or in psychological counseling and school psychology. Outlines of the specific prerequisite requirements and the Master's degree requirements may be procured from the Psychology Department, Division of Counselor Education.

**Certification as a School Counselor.** Institutional endorsement for counseling certification is given to qualified applicants who successfully complete either the Master's degree program or in lieu of the Master's degree, the minimum number of graduate credits and specified course areas required by the State for the Professional Counselor's Certificate. All applicants seeking institutional endorsement for certification are expected to meet the general qualifications for admission to graduate school. Even though the applicant is a non-degree candi-

date, he must apply and be accepted into the graduate school, as such, in order to pursue institutional endorsement for either the Basic Professional or Professional Certificate. Course outlines relative to counselor certification may be obtained from the Psychology Department, Division of Counselor Education.

**Doctorate in Educational Psychology.** The Department of Psychology in cooperation with the Department of Education has planned a program of advanced graduate study in counseling, school psychology that leads to the EdD degree in Educational Psychology with specialization in Counseling, School Psychology and Development-Learning. The program requires two years of graduate study, including supervision of individual study, beyond the MS degree, and an internship in school, mental hygiene clinic, or social agency.

**PhD Programs in Psychology.** The department offers PhD programs with specialization in the following areas:

1) Animal Behavior, 2) Child and Developmental Psychology, 3) Learning and Motivation, 4) Physiological Psychology, and 5) Social Psychology.

For a description of the programs contact the department head or the Dean of Graduate School.

Committee approval for entrance into any one of these graduate programs is based upon appraisal of 1) the student's undergraduate transcript, 2) scores on the Departmental Comprehensive Test in Psychology, and 3) scores on the Graduate Record Examination.

## Psychology Courses

**20. Spelling Clinic.** The application of programmed techniques to adult spelling improvement. Individual instruction based on diagnostic testing. (1F) **Stone**

**53. Elementary General Psychology.** Principles of behavior of organisms, including: scientific methodology in psychology, the biological basis of behavior, conditioning and learning, perception and thought, child development, personality, abnormal psychology, and industrial psychology. For any lower division student. (5F, W, Sp, Su) **Staff**

**60. Personal Study Efficiency.** Designed to evaluate self-concept as a major factor in study, with discussions of concentration, motivation, and goal-setting in study, study techniques, and personality factors in study. (2F, W, Sp) **Casto**

**71. Experimental Psychology.** A laboratory course of the scientific methods used in the study of behavior. Prerequisite: Psy. 53 (3F, W, Sp, Su) **Staff**

**80. Reading and Study Skills.** A practical course, highly individualized, designed to aid in improving the efficiency of reading and study skills. Individual appointments arranged. (2F, W, Sp) **Stone**

**100. Human Growth and Development.** A study of the developmental characteristics and processes of human physical and psychological development from birth to maturity. Prerequisite: Psy. 53. (3F, W, Sp, Su) **Staff**

**106. Educational Psychology.** A study of the principles of learning in teaching and of the abilities and other relevant characteristics of children and adolescents on the basis of which elementary and secondary teachers can evaluate and/or develop conditions of effective learning. Prerequisite: Psy. 53 (3F, W, Sp, Su) **Frandsen, Stone**

**112. Application of Statistics to Education and Psychology.** Elementary study of statistical procedures in handling test scores and other data, and of the concepts needed to read current educational and psychological literature. (3F, W, Sp, Su)

**Checketts, Sharp, R. Publicover**

**117. Research and Readings.** This course is designed to help promising students become more adept concerning contemporary developments in scientific-laboratory psychology. (3F, W, Sp) **Daley**

**118. Teacher Training Practicum.** A course designed to give promising students training and practical experience in applying the techniques of learning and contingency management to college training. (2F, W, Sp) **Daley**

**120. Improving Personal Reading Efficiency.** Designed to help adults improve their methods of reading. Stresses improvement in organization and comprehension skills, and the ability to flexibly adapt speed to the material and needs of the reader. (3Su) **Stone**

**123. Psychology of Exceptional Children.** The development and behavior characteristics of exceptional children. The education, home management, social control, and psychological treatment suited to their needs. Groups included are the mentally deficient, physically handicapped, the exceptionally gifted, and children having serious personality and conduct problems. (3F, W, Sp, Su) **Staff**

**127. Psychology of Learning.** A comprehensive study of descriptions and explanations of learning. Prerequisites: Psy. 53 and 112. (3F, W, Su) **Daley**

**128. Thinking and Verbal Behavior.** Stresses mediational processes in thinking, cognition, concept learning, transfer, and hypothesizing as elements of complex learning and problem solving. **Stone**

**140. Abnormal Psychology.** A descriptive and explanatory study of the varieties of mental abnormality—psychoses, psychoneuroses, and minor maladjustments—their causes, the methods of treatment, and the mental hygiene approach in preventing psychological maladjustments. Prerequisite: Psy. 53. (3Sp) **Sharp**

**145. Mental Hygiene.** For teachers and other workers in social occupations. Designed to promote understanding of emotional and social adjustments, and as a basis for guiding children, adolescents and adults toward improved mental health. Prerequisite: Psy. 53. (3W) **R. Publicover, Sharp**

**155. Psychology of Business and Industry.** The methods and principles of psychology are applied to several general problems in business and industry, including advertising and selling, selection and placement of employees, motivation and morale, training, conditions at work, and productivity. Prerequisites: Psy 53 and 112 (or equivalent). **Cragun**

**156. Problems in Industrial Psychology.** An analysis of current issues, problems, methodologies, and research in Industrial and Business Psychology. Prerequisites: Psy 112 (or equivalent) and 155. **Cragun**

**161. Social Psychology.** A study of behavior in the framework of social influences, including communication, social interaction, social norms, roles, leadership, influence of culture and social structure on personality, social attitudes, attitude change and propaganda. Prerequisite: Psy. 53 (3F, Sp, Su) **Staff**

**170. Perception.** The development, structure, role in behavior, and factors affecting perceptual processes; a study of the theories and experiments. (3F) **Staff**

**171. Experimental Analysis of Behavior.** The course will emphasize methods and procedures which enable psychologists to manipulate behavior. Current research methods will be emphasized and demonstrated. Nonstatistical analysis of behavior will be emphasized. Prerequisite: Psy. 71 or equivalent. (3F, Su) **Daley**

**172. Motivation.** An introduction and examination of pertinent theories of motivation with special emphasis on the role of motivational factors in human behavior and learning. (3W, Su) **Casto, Sharp**

**174. Sensory Basis of Behavior.** An introductory course into the sensory basis of behavior to include study and experimentation on psychophysical methods, anatomy of receptors, physiology of receptors and central nervous system basis of sensation. Prerequisites: Human Physiology 4, Psy. 53 and 71. (8W) **Staff**

**175. Physiological Psychology.** Physiological mechanisms underlying behavior. (3Sp, Su) **Staff**

**181. Psychometrics Applied to Guidance.** The evaluation, interpretation, and uses of tests of intelligence, aptitudes, interests, personality, and adjustment. Prerequisites: Psy. 53 and 112. (5F, Su) **Frandsen**

**191. History and Systems of Psychology.** History of psychology and a critical comparison of the several systematic points of view on major problems in psychology. (3Sp) **Sharp**

**200. Principles of Learning in Teaching.** A study of learning theory and of experiments in psychology and education for the purpose of developing a set of learning principles as a guide to creating conditions for effective learning to both elementary and secondary schools. Prerequisites: Psy. 53, 112, and 106. (3W, Sp, Su) **Stone**

**202. Psychology of Adolescence.** Growth, psychological and social characteristics, development, educational and guidance needs, and adjustment problems of adolescents as met in schools, homes, and communities. Prerequisite: Psy. 53. (3Sp, Su) **Staff**

**205. Child Psychology and Development.** The roles of maturation, learning, and environmental conditions in the motor, mental, social, emotional, and personality development in children from birth to adolescence. Prerequisite: Psy. 53. (3F, Su) **Casto**

**212. Advanced Applications of Statistics to Education and Psychology.** This second course covers analysis of variance and covariance, varied correlation techniques, partial and multiple correlation, and nonparametric methods. Prerequisite: Psy. 112. (3W, Su) **Checketts, Shaver**

**214. Independent Readings in Psychology.** For students who cannot participate in the discussion in Psy. 215, this course provides opportunity for independent readings and conferences on topics individually selected. Prerequisite: prior course in the area of the topic selected. (2F, W, Sp, Su) **Staff**

**215. Seminar Discussion of Current and Special Topics in Psychology.** Weekly discussions of topics in current magazines plus independent reading either of some especially significant book or periodical literature on a specialized topic, selected according to student's interest. May be taken 1, 2 or 3 quarters. (2F, 2W, 2Sp) **Staff**

**217. Research for Master's Thesis in Psychology.** Credit arranged. (F, W, Sp, Su) **Staff**

**224. Characteristics of the Mentally Retarded.** A study of the characteristics, identification, and treatment of the mentally retarded. Emphasis upon the psychological, social, and educational problems in the treatment and control of the mentally handicapped. (3Sp, Su) **Halstrom**

**225. Characteristics and Education of the Gifted Child.** A study of the characteristics, means of identifying, guidance, and education of gifted children. (3W, Su) **Halstrom**

**227. Theories of Learning.** An integration and synthesis of the literature. A comparison and evaluation of alternate operational and theoretical explanations of learning. (3F) **Stone**

**235. Observation and Case Analysis in Play Therapy.** Exploration of theories and potentialities of specialized play therapy experience. Concepts and principles in the interpersonal process are examined and developed. (3F) **Casto**

**238. Practicum in Play Therapy.** Direct experience with children in the play therapy situation. Prerequisite: Psy. 235. (2F, W, Sp, Su) **Casto**

**261. Advanced Social Psychology.** Experimental and theoretical studies of selected current topics in social psychology—including group behavior, motivation, reactions to frustration and conflict, attitude measurement, personality development, and cultural aspects of behavior. Prerequisite: Psy. 112 and 161. (3W) **Staff**

**262. Social Psychology of Teaching.** Applications of the principles of social psychology in teaching, including study of social structures and dynamics of instructional groups; roles of teacher and students; formation and effects of group norms; and of factors affecting group learning and problem solving, discipline, and self and social development. (3Sp, Su) **Staff**

**263. Attitudes and Attitude Measurement.** A study of basic issues in the study of attitudes, including: measurement, structuring, and such current issues as primacy-recency effects, immunization, etc. Prerequisites: Psy. 212 and 261. **Staff**

**264. Experimental Social Psychology.** A review and critique of the experimental literature in certain selected areas of social psychology. Students will be required to prepare and carry out an experiment in one of these areas. Prerequisites: Psy. 212 and 261. (3W) **Staff**

**265. Culture and Personality.** A study of the relationship between various cultural systems and their effect on personality. Various theoretical orientations will be reviewed including psychoanalytic theory, general behaviorism and field theory. Prerequisite: Psy. 261. (3Sp) **Staff**

**266. Small Group Analysis.** An analysis of small groups, including: problems of measurement, theories of interaction, role behavior, norms, group size, leadership, normative behavior, etc. Prerequisites: Psy. 212 and 261. **Staff**

**267. Research in Psychology on Education.** See Educ. Adm. 267. (3F, Sp, Su) **Shaver**

**271. Seminar in Conditioning Techniques.** The course will emphasize current research in respondent and operant conditioning. The student will be responsible for an independent survey of the literature or an independent experimental demonstration. (3W) **Daley**

**274. Sensory Basis of Behavior.** An advanced course in sensation concentrating on the physiological basis of sensation. This course is designed for the graduate student in physiological psychology. It is a survey of current research in both the cellular and gross physiological basis of sensation. Prerequisite: Psy. 174. (3W) **Staff**

**275. Advanced Physiological Psychology.** Neuroanatomy and neurophysiological basis of behavior. A survey of brain and behavior from the cellular level on up. Current research in neuropsychology will be emphasized. Prerequisites: Psy. 174, 175. (3Sp) **Staff**

**276. Comparative Psychology.** A phylogenetic study of animal behavior. Comparing naturalistic and experimental findings. (3Sp) **Daley**

**280. Personality.** An advanced study of the organization, development, dynamics, and appraisal of personality. Theories and empirical investigations of personality are studied as a basis for arriving at integrated concepts of the nature and development of personality. (3Sp, Su) **Sharp**



**282. Individual Diagnostic Intelligence Testing.** Techniques of individual testing, including intensive practice in the administration and interpretation of 1) the Stanford-Binet and Wechsler's intelligence scale for children, in the examination of school-age children, and 2) Wechsler's adult intelligence scale for use with adolescents and adults. Prerequisite: Psy. 181. (3W, Su) **Frandsen, Doidge, Casto**

**283. Principles and Techniques of Counseling.** Principles and techniques of counseling students on problems of curriculum planning and vocational choice, on improving methods of study, and emotional and social adjustment. Prerequisites: Psy. 53, 102 and Educ. 128. (3F, Su) **Bertoch, Wright**

**284. Theories of Counseling.** An advanced study of the theories of counseling, to develop greater understanding of and a more effective approach to counseling. Prerequisite: Psy. 283. (3W, Su) **Bertoch, Wright**

**285. Introduction to Projective Methods of the Study of Personality.** The dynamics of human adjustment and the common projective methods for revealing motives, attitudes, and adjustment mechanisms of children and adults. Prerequisite: Psy. 181. (3Sp, Su) **Casto, Frandsen**

**286. Group Procedures in Counseling and Guidance.** The intent of this course is to acquaint the student with current theory and practice in the use of groups for various educational and psychological processes and to effect some initial skills in working particularly with guidance, counseling, and/or therapy groups. Prerequisite: Psy. 181, 283. (3W, Su) **Wright**

**287. Educational Occupational Information.** Collection, classification, and uses of occupational information in counseling.

**Bertoch**

**288. Practicum in Counseling.** Supervised practice in counseling in elementary or secondary schools, in the University or in clinical or guidance agencies. Prerequisites: Psy. 181, 284. (2F, W, Sp, Su) **Bertoch, Wright, Peterson**

**289. Practicum in Psychological Testing.** Supervised practice in psychological testing in elementary or secondary schools, in the University, or in clinical or guidance agencies. Prerequisite: Psy. 282. (2Sp) **Frandsen, Doidge, Casto**

**290. Internship in Counseling and Guidance.** A one-quarter internship for prospective counselors in approved school systems or other agencies of Utah and Idaho. In some settings the trainee may receive a stipend for fulltime work. The intern will be placed in a field setting appropriate to his anticipated employment goals, and will be supervised by a qualified person in the field setting and by

the counselor education staff of the University. Prerequisite: consent of the Director of Counselor Education. (6F, W, Sp)

**Bertoch, Wright**

**297. Workshop in Guidance.** A faculty or part of a faculty in a school district studies, evaluates, and attempts to improve the use of the school's resources for more effective guidance in its several phases. (3F, W, Sp) **Staff**

**298. Techniques of Programming.** Analysis of program efficiency based on a study of curricular sequence. Review of research and laboratory work on styles of program construction. (3Su) **Stone**

**300. Psychological Foundations of Education.** From a study of the psychological-educational theories and supporting experiments—on motivation, learning, abilities, interests, personality, interpersonal relations, teachings, and evaluation—students will formulate an integrated theory of teaching. (3W) **Frandsen**

**305. Advanced Child Psychology.** A critical and creative approach to the study of the nature and factors affecting child development, including the consideration of theories, experiments, and proposed new studies in the field. (3W) **Frandsen**

**310. Educational Diagnosis of Learning Difficulties.** Principles from educational psychology applied to the diagnostic study of the difficulties students have in learning reading and other subjects. (3F, Su) **Stone**

**314. Advanced Independent Study in Psychology.** Credit arranged. (F, W, Sp) **Staff**

**315. Doctoral Colloquium.** A colloquium on advanced theories and research in Psychology. Required of all PhD and EdD candidates. (3Sp) **Staff**

**317. Research for the Doctorate Thesis in Psychology.** (F, W, Sp) **Staff**

**323. Advanced Exceptional Child.** A critical and creative approach to the study of the characteristics, education, and guidance of exceptional children. (3F) **Owens**

**381. Advanced Psychometrics.** The basic principles of psychometrics as applied in the construction, evaluation, interpretation, and uses of tests of abilities, achievement, interests, and personality. (3W) **Frandsen**

**386. Problems in Counseling.** Individual case studies of children and adolescents presenting problems of diagnosis, guidance, remedial teaching, and psychotherapy. (3F) **Wright**

**387. Clinical Internship.** A clinical internship for doctoral candidates in which advanced testing, diagnosis, and the writing of psychological protocols is practiced in mental hospitals, mental health clinics and child guidance

centers. Administration and interpretation of mental tests, projective tests and aptitude tests will be supervised by clinical psychologists in the center and by departmental staff. Financial support by the center for selected candidates will be available. Approved centers: Cache County Mental Health Clinic, Utah State

Industrial School, Ogden, and Wyoming State Mental Hospital, Evanston, Wyoming.  
(3-6F, W, Sp, Su) **Sharp, Casto**

**388. Internship in School Psychology.** Supervised practice in providing psychological services in a school setting. (3F, W, Sp) **Staff**

## Department of

# Secondary Education

**Acting Head: Associate Professor** Ross R. Allen  
Office in Education 104

**Professors** John C. Carlisle, Eldon Drake; **Associate Professors** Pearl Budge, Kenneth C. Farrer,<sup>1</sup> John Haas; **Assistant Professors** Theodore Ivarie, Samuel P. McEvoy, H. Dale Rasmussen, Walter L. Saunders.

**Degrees:** Bachelor of Arts (BA), Bachelor of Science (BS), Master of Arts (MA), Master of Science (MS), Master of Education (MEd), Doctor of Education (EdD).

**Major:** Secondary Education.

The junior and senior high schools offer a rewarding career for men and women who are interested in teaching in two closely related subjects and who have a desire to understand and work with teenagers. Although teaching in the secondary schools makes great demands upon a teacher, he will find it to be richly rewarding in mental stimulation. Teaching offers one an opportunity to work with other adults of similar tastes and values. Capable secondary school teachers enjoy maximum job security with long-range career opportunities and continually increasing financial rewards.

An unprecedented number of opportunities for on-the-job, summer, or graduate training are available for today's young teachers, and more are in the offing. National and regional workshops are avail-

able in many subjects. Overseas employment affords new opportunities for those wishing to combine travel and teaching. Graduate work with teaching fellowships is available at most universities. Research and development grants are now available under the Elementary and Secondary Education Act of 1965. Through new teaching media and experiments in class and school organization, young teachers find ways to improve their skills of instruction.

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.

## Undergraduate Study

The Department cooperates with other departments of the University which graduates students with

<sup>1</sup>On leave.

secondary teaching majors in providing the professional education courses necessary for certification. The secondary certificate qualifies the candidate to teach in junior and senior high schools (grades 7-12).

Teaching majors and minors are provided in all areas in which there are classes taught in the secondary schools of the state. It is ordinarily recommended that the majors and minors be selected from related areas. In lieu of majors and minors it is also possible to select composite majors in closely related areas. A complete listing of the requirements for each of the teaching areas can be found in the publication, **Teaching Majors and Minors for Secondary School Teachers**, available in the Department of Secondary Education.

A listing of the areas available for concentration are:

Art, Biological Sciences, Business, English, Foreign Languages, Health and Physical Education, Industrial and Technical Education, Music, Physical Sciences, Social Studies, and Speech and Drama.

To obtain the Bachelor of Science degree in secondary education and qualify for the Utah Teacher's Certificate for secondary schools, the student must meet the following minimum requirements:

#### **Lower Division**

Natural Science:	
Biological Sciences .....	10
Exact Sciences .....	10
Humanities .....	10
Social Sciences .....	10
Psychology 53 .....	5
Basic Communications .....	9
Physical Education .....	3

#### **Teaching Major and Minor.**

An approved teaching major of not fewer than 36 credits, of which 15 must be upper division, and an approved teaching minor of not fewer than 24 credits must be completed.

A composite teaching major consisting of not fewer than 60 credits in two or more related subjects may be selected. Courses required or recommended for majors, minors, and composite majors are agreed upon by the various subject departments, the Department of Education, and the Council on Teacher Education. For a list of approved programs consult the handbook on **Approved Teaching Majors and Minors in Secondary Education**. Students completing a teaching major and minor may graduate in either the department offering that major or the Department of Education. Individuals completing a composite major usually graduate from the Department of Secondary Education.

**Admission to Teacher Education.** Regardless of the department in which the student majors, he must apply and be granted permission to enter the Teacher Education program by the Admissions Committee of the Department of Education prior to enrolling in *any* Education course. It is advisable for the student to make the "Application for Admission" to Teacher Education at the end of the Sophomore or the beginning of the Junior year.

A student must be admitted to student teaching in addition to admission to Teacher Education. Total grade point of 2.0 or above and the grade point average in the teaching major, minor and professional certification subjects of 2.5 or above are required for entrance to student teaching. The student should be financially prepared to stay off-campus during the quarter which he has selected as his professional quarter of student teaching.

**Professional Courses in Education.** For a Utah Teacher's certificate for secondary schools,

students must complete 33 required credits, and if majoring in secondary education, an additional three credits. The professional courses are to be taken in the various divisions as follows:

Required Courses:	Credits
Group 1) Understanding the Pupil (minimum 9 credits)	
Public Health 155 .....	3
Psychology 100 .....	3
Psychology 106 .....	3
Group 2) Understanding the School (minimum of 6 credits)	
Sec Education 126 .....	3
Education Adm 150 .....	3
Group 3) Student Teaching, Methods and Curriculum (minimum 15 credits) Professional quarter.	
Sec Education 127 .....	3
Sec Education 129 .....	6
Sec Education 130 .....	6

Group 4) Special Methods (minimum 3 credits)  
Students are required to take the special methods course in a teaching major if it is offered. The special methods course in the minor field is suggested.

Each candidate for secondary school teaching is to select the one quarter which best fits his sequence of classes during which time he will spend all day in Teacher-training in absentia of campus classes. An additional application must be made for student teaching and credentials are re-evaluated at that time. Secondary Education 127, 129, and 130 are to be taken concurrently and will yield 15 credits during this professional quarter.

**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 15 credits required for certification in secondary education, and a special methods course in either the teaching major or

minor, and student teaching on the secondary level.

A student desiring to obtain both the elementary and the secondary certificates should consult with an adviser in the Secondary Education Department early in his program. Curricula are also designed for dual certification in Secondary and Special Education.

**Homemaking, Industrial Teacher Education, Agriculture.** Students desiring to major in Homemaking Education, Industrial Education or Agricultural Education should consult the professional education requirements listed under these departments.

## Graduate Program

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 degree. The Secondary Education Department offers the MEd, MA, and MS in teaching, and the EdD in Curriculum Development and Supervision. Students desiring information concerning the various graduate programs should write to or consult with the department head and write to Dean, School of Graduate Studies, for a graduate catalog which contains the details on the various graduate programs and making application for admission to a graduate program.

## Secondary Education Courses Undergraduate

**126. Principles of Secondary Education.** The background and status of the American secondary school. Problems concerning desirable objectives and functions are analyzed. An introduction to various type curricula and methods. (3F, W, Sp, Su) Allen, Carlisle, McEvoy, Saunders, Staff

**127. Secondary School Methods.** Considers the problems arising during student teaching. Dis-

cusses planning, teaching procedures, adapting classroom practices to individual differences, testing, and evaluation. To be taken during the same quarter as Ed 129 and 130. (3F, W, Sp, Su) **Staff**

**128. Principles of Guidance.** Emphasis given to organization of guidance as a service, including individual and occupational differences, tests, measurements, and counseling. (3F, W, Sp) **Staff**

**129. Student Teaching in the Secondary Schools.** Members of the class are assigned to a sponsor teacher in secondary schools for student teaching in their major and minor subjects. A brief period of observation is followed by gradually increasing responsibilities until, upon completion of the assignment, the student has had guided experiences in all professional responsibilities of the typical faculty member in the secondary school. Prerequisites: Psy. 100, 106 and Ed 126, and special methods in major and/or minor subjects. (6F, W, Sp) **Staff**

**130. Student Teaching in the Secondary Schools.** Members of the class are assigned to a sponsor teacher in secondary schools for student teaching in their major and minor subjects. A brief period of observation is followed by gradually increasing responsibilities until, upon completion of the assignment, the student has had guided experiences in all professional responsibilities of the typical faculty member in the secondary school. Prerequisites: Psy. 100, 106 and Ed 126 and special methods in major and/or minor subjects. (6F, W, Sp) **Staff**

**131. Student Teaching in Higher Education.** Enrollment by permission only. Especially adapted to instructional assignments of graduate assistants, laboratory instructors, or other graduate students who might be specifically preparing for college teaching. (4W, Sp) **Staff**

**134. Social Studies in the Secondary School.** Formerly 118. A methods course for secondary school teachers with teaching majors or minors in any of the social sciences. (3F, Sp, Su) **Haas**

**135. The Teaching of English.** Considers the content of the English course, effective methods, and significant trends. (4F, Sp, Su) **Budge, Staff**

**145. Teaching Science In Secondary Schools.** Aims and objectives of science education in the secondary schools and the development of curriculum materials to achieve these aims. Class members develop teaching units in science taught in the secondary school. (3F, Sp, Su) **Saunders**

**146. Laboratory Practicum for Secondary Science Teachers.** Lecture and laboratory experience provides initiation into investigative

laboratory techniques and procedures appropriate for the new high school science curricula. (3W, Sp) **Saunders**

**147. Improvement of Reading in Secondary Schools.** A study of research and classroom practices is designed to assist secondary school pupils with low reading abilities. For English teachers and those wishing to qualify for remedial reading certificates. (3W, Su) **Budge**

**150 The American School System.** See Educ. Adm. 150. (3F, W, Sp, Su) **Ballam, Hansen**

**153.** See Educ. Admin. 53, Soc. Found of Educ. (3F) **Hansen**

**154.** See Educ. Admin. 154 History of Educ. (3Sp, Su) **Hansen**

**155. Util of A-V Mtls.** See IMLS 155. (3F, W, Sp, Su) **Drake, Beutler**

**164. Measurement and Evaluation in Education.** Evaluates procedures in education including principles of measurements, tests, and text construction. The development of more valid and objective teacher-made tests will be studied. (3F, W, Sp, Su) **Staff**

**165. Production of A-V Materials.** See IMLS 165. (3F, W, Sp, Su) **Smellie**

**186. Diagnosis and Treatment of Learning Difficulties.** See Special Education 186. (3F, Sp, Su) **Stone**

## Secondary Courses Offered in Other Departments

Applied Linguistics for Teachers (See French 113, Greek 112, Spanish 112).

Methods in Physical Education (See PE 120).

Teaching of Speech (see Speech 123).

Art Methods (See Art 152).

Music Methods (Music 151, 152, 153).

Teaching of Mathematics (See Math 175).

Business Education Methods (See BE 178, 179).

## Graduate Courses

**230. Secondary School Curriculum.** A study of the secondary school curriculum, junior and senior high school, as it now exists in typical schools, together with proposals for improvement. (3F, Su) **Allen, McEvoy, Farrer, Staff**



**232. Aerospace Education.** See Industrial Education 232. (3Su) **Summers**

**233. The Junior High School.** Formerly 217. A study of the junior high school as it has developed as a distinct segment of the American Public School system, its functions, organization and curriculum, together with recommendations for improvement. (3Su) **Staff**

**237. Seminar in Secondary Education.** For graduate students in secondary education and those preparing for school administration or supervision in junior or senior high school. Reviews current research in areas of interest to class members. (3Sp, Su) **Allen, Farrer**

**240. Improvement of English and Language Arts in Secondary Schools.** An advanced course for experienced teachers. Evaluates significant changes in content and methods as revealed by formal research and successful practice. (3W, Su) **Budge**

**241. The Improvement of Social Studies in the Secondary School.** For experienced teachers. Deals with newer concepts in curriculum and methods of instruction in social studies in the secondary school. (3F, Su) **Haas**

**242. The Improvement of Science in the Secondary School.** For experienced teachers. Deals with newer concepts in curriculum and methods of instruction in physical and biological sciences in the secondary school. (3Sp, Su) **Saunders**

**243. The Improvement of Mathematics in the Secondary School.** For experienced teachers. Deals with newer concepts in curriculum and methods of instruction in mathematics in the secondary school. (3W, Su) **Allen**

**256. Social Studies Curriculum.** Recurring philosophical problems in social studies education, their relationship to curriculum choices in a democracy, and problems of content selection and methodology in the light of desired objectives. Prerequisite: Ed 134. (3F, W, Sp) **Haas**

**258. Practicum in the Evaluation and Improvement of Instruction.** Designed as an in-service training course for experienced teachers and administrators. Emphasis is given to evaluating and improving the educational program in a particular school or school district as a result of an assessment of the needs of the

community and instructional procedures and teaching methodology. (3Su) **Staff**

**259. Supervising Student Teaching.** Considers ways and means of providing desirable experiences for student teachers in the public schools. The role of the classroom teacher and the college supervisor will be analyzed. (3F, Su) **Staff**

**264. Instructional Leadership in Education.** Principles and practices of school supervision, including qualifications and responsibilities of supervisors of instruction in public education. The role of the principal, the curriculum director and other administrators in instructional leadership will be considered. (3W, Su) **Allen, Farrer, McEvoy**

**266. Introduction to Research in Education.** See Educ Adm 266. (3F, Su) **Carlisle**

**267. Research in Psychology and Education.** See Educ Adm 267. (3F, Su) **Shaver**

**283. Reading and Conference.** Provides for individually directed study in subjects of special interest and preparation. Credit arranged. (F, W, Sp, Su) **Staff**

**285. Research and Thesis Writing.** Formerly 271. Individual work in thesis writing with guidance and criticism. Credit arranged. (F, W, Sp, Su) **Staff**

**364. Theories of Teaching.** Analysis of various teaching methodologies used in classrooms. For Doctoral students only. (3Sp, Su) **Allred, Farrer**

**365. Curriculum Development.** Formerly 315. Advanced problems in curriculum building. Philosophic bases of the curriculum, current practices, and organization for curriculum study. Doctoral students only. (3W, Su) **Farrer, Haas, Allred**

**366. Internship in School Supervision.** Provides extensive experience for the advanced student working on the Doctor of Education degree in Curriculum Development and Supervision. The student works a minimum of one quarter fulltime under the direction of an administrator, in a public school or university. Doctoral students only. Credit arranged. (F, W, Sp) **Staff**

**385. Field Studies and Thesis.** Formerly 375. Individual work on research problems in the EdD program. Credit arranged. (F, W, Sp, Su) **Staff**

Department of

## Special Education

**Acting Head:** Associate Professor Kaye Don Owens  
Office in Education 408

**Associate Professors** Frederick Berg, Frances Halstrom;<sup>1</sup> **Assistant Professors** John Jacobs, Phyllis Publicover, Robert Publicover, Devoe Rickert; **Instructors** Gordon Belnap, Marnell Jacobs, Betty Janiak, Kenneth Morgan.

**Degrees:** Bachelor of Science (BS), Master of Education (MEd), Master of Science (MS), Doctor of Education (EdD).

**Major:** Mental Retardation (other areas open to graduate students.)

Buyers of stock usually seek a "growth industry," an industry which has great prospects for future growth and large profits.

Education is the largest business in this country. It has a greater growth potential than any other enterprise. That portion of education which is called "special education" contributes much more than its proportionate share to the overall growth of education. Special Education is growing by leaps and bounds, and yet the spectacular growth cannot keep up with demand.

It has been estimated that there will be a demand during the next five years for 70,000 new special education teachers. Right now it seems that only about a third of this number will be trained in time to meet this need. And these figures do not take into account replacements needed for retiring teachers. There is no shortage of positions in this field!

What is this fantastically growing Special Education? It is the name given to the organization, teachers, and supervisors who are concerned with teaching the gifted, the emotionally disturbed, the mentally handicapped, physically handicapped, and the culturally

disadvantaged. Children in these categories cannot profit from the standard schooling given to the majority. And this is what makes special education "special"—especially trained teachers in special classrooms with special equipment using special methods.

The Department of Special Education offers a wide range of training opportunities for teachers, supervisors, research workers, future college teachers, psychologists, and social workers. All courses are open to all students who have the prerequisites.

Prospective teachers may acquire dual certification in either Elementary Education/Special Education or Secondary Education/Special Education.

For a dual certificate with Elementary Education, 36 credits in one field or 18 credits in each of two are required. The selected fields must be in subject areas pertinent to Elementary Education and Special Education classes. If two minor fields are selected, one may be a supporting area, such as Child Development or Library Science.

For a dual certification with Secondary Education, an approved teaching major of 36 credits and an approved teaching minor of 24 credits are required.

<sup>1</sup>On leave

Dual certification programs should be planned with advisers from both departments. Usually, about 30 to 35 credits above those required for elementary or secondary certificates are necessary to also acquire the special education certificate.

**Bachelor of Science in Special Education, with emphasis in mental retardation.**

All candidates for this degree must fulfill the general education (group) requirements, amounting to 55 credits, which are explained under "Lower Division Requirements" in the front part of this catalog.

An additional 35 credits are needed to complete lower division requirements, and these courses should be chosen in consultation with your Special Education adviser.

Before the end of the sophomore year, the student who plans to meet the requirements for a teaching certificate must apply through the Dean of the College of Education for admission to the professional education courses, of which a total of 62 credits are required. Twenty-seven of the professional education credits are required in the field of special education. They are:

Psychology 123 .....	3
Psychology 100 .....	3
Special Education 185 .....	3
or	
Physical Education 126 (3) .....	
Special Education 184 .....	3
or	
Special Education 187 (3) .....	
Special Education 186 .....	3
Special Education 124 .....	3
Special Education 191 .....	6
Special Education 195 .....	3
Total .....	27

To meet graduation requirements, the student must also take 64 credits in content courses applicable to a teaching field.

**Basic Professional Certification**

The satisfactory completion of the above course of study results in a Bachelor of Science Degree in Special Education with emphasis in the teaching of the mentally retarded, plus a recommendation for the award of the Basic Professional Certificate in Special Education (MR). This certificate is for Utah; anyone wishing to teach elsewhere must obtain certification for that state. The above course of study is designed to meet most of the requirements in other states.

A Basic Professional Certificate is issued for a five year period, after which the holder must either renew the certificate with nine more credits of approved study, or take 12 more to be eligible for the Professional Certificate.

**Graduate Study**

At the graduate level one may specialize in:

- Emotional and Social maladjustment;
- Remedial Reading;
- Gifted;
- Disadvantaged, or
- Hard of Hearing children (in cooperation with the Department of Audiology and Speech Pathology)

**Graduate Non-Degree Program with Professional Certification to Teach Mentally Retarded**

**Prerequisites**

1) Bachelor's degree; 2) Elementary, Secondary, or Special Teaching Certificate; 3) Three or more years of verified successful teaching; 4) Basic Professional Certificate or eligibility to receive this certificate. To be eligible for this certificate, one must have successfully passed the 27 credits of professional special education

courses listed above under the requirements for a Bachelor's degree.

### The Program

Having met the prerequisites, the student is ready to pursue the course of study leading to Professional Certification. This program consists of the following:

Special Education 288 .....	3
Special Education 289 .....	3
Special Education 298 .....	3
Special Education 294 .....	3
Special Education 293 .....	3
Special Education 287 .....	3

Select 12 credits from this total ..... 18

### Master of Education in Special Education, with Professional Certification to teach mentally retarded

Basic Required Courses	Credits
Educational Administration 266 .....	3
Special Education 285 .....	3
Special Education 124 .....	3
Special Education 184 .....	3
or	
Special Education 187 (3) .....	
Special Education 186 .....	3
Special Education 185 .....	3
or	
Physical Education 126 (3) .....	
Special Education 195 .....	3
Special Education 191 .....	6
Psychology 100 .....	3
Psychology 123 .....	3
	33

The candidate must choose, in consultation with his adviser, 12 credits from the following:

Special Education 287 .....	3
Special Education 288 .....	3
Special Education 289 .....	3
Special Education 293 .....	3
Special Education 294 .....	3
Special Education 298 .....	3

The total program must include at least 48 credits, 25 of which must be at the 200 level. For those who have satisfied some of the basic required courses before entering the graduate program, ad-

vanced courses must be chosen to make up the total of 48 credits.

Candidates for this degree who have not had their undergraduate work in special education should expect to spend more than three quarters completing the requirements.

### Master of Science in Special Education, with professional certification to teach the mentally retarded

This program is identical with that outlined immediately above, except that the student must take Ed Adm 267 instead of 266 and Sp Ed 285 for three to nine credits. The candidate is expected to do his thesis in his area of concentration.

### Master of Science in Special Education, without Utah certification

This course of study is for students who plan to meet the requirements to teach mentally retarded in states other than Utah, or plan to deal with mentally retarded persons in educational settings or service areas other than the public school classroom. Twenty-four credits must be in the field of mental retardation, and the general requirements for an MS degree must be met. It is the responsibility of the student, in conference with his graduate committee, and with their approval, to select a program which will meet requirements.

### Master of Education in Special Education with Basic Professional Certification

This plan is for those students who desire an MS degree and a Utah Basic Professional Certificate (rather than a Professional Certificate), with emphasis in another approved (not special education) field.

The requirements are identical to the basic required courses for the MS with professional certification, plus selected courses in the area of interest. A total of 48 committee-approved credits, 25 of them at the 200 level, is the minimum.

**Undergraduate Foundation to Teach Children with Learning and Adjustment Disorders**

These recommendations are meant to assist undergraduates interested in learning and adjustment problems of children to choose elective courses which will furnish a foundation for their studies in the field.

Psych 123, Psych 140, Sp Ed 1, Sp Ed 99, Sp Ed 186, Sp Ed 192, Sp Ed 193, and Sp Ed 195 may be accepted as a supporting area minor in elementary education. Students in secondary education may use any of the above courses for electives, and the list may prove helpful to special education undergraduates.

**Master of Education (or Science) in Special Education, with emphasis on learning and adjustment disorders**

There are three degree offerings in this area of specialization:

- 1) MS with professional certification,
- 2) MS without professional certification, or
- 3) ME with professional certification

**Please Note:** As this catalog goes to press, final approval of State certification is pending. This program is designed to meet that certification.

A teaching certificate (elementary or secondary) is prerequisite to a program for professional certification.

Core for All Programs		Credit
Psychology 123 .....		3
Special Education 186 .....		3
Special Education 193 .....		3
Special Education 291 .....		3
Special Education 292 .....		3
or		
Special Education 293 (3) .....		
Special Education 192 .....		3
Special Education 191 .....		3-6
Sp Ed 285 (ME programs) .....		3
Sp Ed 285 (MS programs) .....		3-9
Ed Admin 266 (ME programs) .....		3
Ed Admin 267 (MS programs) .....		3
Psych 181 (MS programs) .....		3

Approved electives to complete the requirements of 45 credits (MS) or 48 credits (ME).

**Master of Education (or Science) in Special Education, with emphasis on Compensatory Education**

This course of study is designed to meet the needs of teachers of children and youth whose learning difficulties are attributed to the cultural differences and deprivations which are prevalent among children from socially or economically disadvantaged environments.

At present, a separate teaching certificate is neither offered nor required in Utah or adjacent states. Students who elect this course of study should already have a teaching certificate, though it is not required for the MS degree.

Required courses should be taken in the sequence shown below. Student teaching may be waived for acceptable experience; but if required, the total program may take four quarters to complete. A candidate may return to his own school, to his regular job, for the student teaching, provided a substantial proportion of the pupils are judged to be culturally or educationally disadvantaged and the school is in this geographical area.

<sup>1</sup>May be waived for acceptable experience.



**First Quarter**

Anthropology 105 or 165 .....	3
Special Education 299 .....	5
Special Education 296 .....	3
Special Education 285 .....	1
Psychology 123 .....	3

**Second Quarter**

Special Education 294 .....	3
Special Education 192 .....	3
Special Education 195 .....	3
Ed Admin 266 (for ME programs) .....	3
Ed Admin 267 (for MS programs) .....	3
Special Education 285 .....	1
Elective .....	2-3

**Third Quarter**

Special Education 285 .....	1-4
Electives .....	13-16

**Indian Education.** The above program may be modified to meet the needs of those interested in the education of American Indians.

**Master of Education in Special Education,** with emphasis on teaching the gifted

A teaching certificate is prerequisite to entry into this program.

Required Courses	Credits
Psychology 123 .....	3
Special Education 186 .....	3
Special Education 191 .....	6
Special Education 192 .....	3
Special Education 286 .....	3
Special Education 290 .....	3
Special Education 285 .....	3
Special Education 295 .....	3
Educational Administration 266 .....	3
Elementary Education 220 .....	3
Psychology 225 .....	3

Plus at least 15 committee-approved graduate credits for a total of 48.

**Master of Science in Special Education,** with emphasis on teaching the gifted

This major is the same as that shown above except that Ed Admin 267 replaces Ed Admin 266 and a thesis of 3-9 credits must be written in the field of the gifted. Forty-five graduate credits instead of 48 for the ME, is the minimum total.

**Master of Science (or Education) in Special Education,** with emphasis on remedial reading

Either an elementary or secondary teaching certificate is a prerequisite to entry into this course of study. Also prerequisite are Ed 107 and Engl. 122.

Required Courses	Credits
Psychology 123 .....	3
Special Education 186 .....	3
Special Education 213 .....	3
Special Education 214 .....	3
Special Education 216 .....	3-6
Ed Admin 266 (for ME programs) .....	3
Ed Admin 267 (for MS programs) .....	3
Sp Ed 285 (for ME programs) .....	3
Sp Ed 285 (for MS programs) .....	6-9
Elementary Education 225 .....	3
Electives approved by student's graduate committee .....	
Total for MS .....	45
Total for ME .....	48

**Master of Science in Educational Audiology.** This degree is administered by the Department of Audiology-Speech Pathology. Please refer to their section of the catalog for full information.

**Master of Science (or Education) with emphasis on the Multiple handicapped.** This program is currently under development. If interested, please contact the head of the department.

**Doctorate Program.** For information, write to the Department Head or to the Dean of the School of Graduate Studies.

**Special Education Courses**

**1. Orientation to Special Education.** Introduces the students to Special Education provisions in public schools, community centers, institutions, etc., throughout Utah. Special emphasis is placed on observing children who have been placed in education facilities. Field trips are arranged during the course.

(2F, Su)

**Staff**

**2. Directed Observation.** Provides for observation of exceptional children in various school activities. Observations are directed by an instructor familiar with the behavior and learning characteristics of the persons under observation. Such contacts with exceptional children will help the student determine his interest, strengths, and weaknesses before entering the field of Special Education. Characteristics which affect learning will be observed intensively with individual children.

(2F, W, Su)

**Staff**

99. **Introduction to Compensatory Education.** Definition of the problems of the educationally disadvantaged pupil, and discussion of programs which have been tried. (2F, Su)

R. Publicover

126. **Physical Education for the Mentally Retarded.** See Physical Education 126. (3F, W, Sp, Su)

Belnap

127. **Psychology of Learning.** See Psychology 127. (3F, W, Su)

Frandsen

154. See Ed Adm 154 History of Ed (3Sp, Su)

Hansen

164. **Measurement and Evaluation in Education.** See Secondary Education 164. (3F, W, Sp, Su)

Staff

171. **Programs for Recreational Therapy.** See Physical Education 171. (3W)

Burnett

180. **Education of the Hearing Impaired.** Academic evaluation, guidance and acceleration of the hearing impaired; systematic procedures for optimal development of reading, mathematical, social, and scientific academic skills; cooperation with regular school personnel. (3W, Su)

Berg

181. **Characteristics of the Hearing Impaired.** Evaluation techniques used in placement, education, and guidance of the hearing impaired; associated psychological, social, educational and vocational problems; special apparatus, devices, techniques and educational approaches; mental, emotional, symbolic, motor and visual problems. (3Sp, Su)

Berg

181. **Psychometrics.** See Psy 181. (5F)

Frandsen

184. **Curriculum for the Mentally Retarded—(Trainable).** A study of curricula and adaptations in methods specifically suited to the abilities of mentally retarded children. Provides helpful guidance both for teachers of special classes and public schools and teachers in community centers. Psychology 123 is a prerequisite or should be taken concurrently. (3F, Su)

Owens, Rickert

185. **Arts and Crafts for the Mentally Retarded.** A laboratory study of methods and procedures of arts and crafts in classroom and instruction for the mentally retarded. (3F, Sp, Su)

Laird, Owens

186. **Diagnosis and Treatment of Learning Difficulties.** A study of methods of dealing with learning difficulties in basic educational skills of pupils in the elementary and secondary schools. The emphasis is upon developmental and corrective measures in the typical classroom. (3F, Sp, Su)

Owens, Stone

187. **Curriculum for the Mentally Retarded—(Educable).** A study of curricula and adaptations in methods of teaching especially suited to the needs and abilities of mentally retarded children. Provides helpful guidance both for

teachers of classes for these children and for teachers who provide for them in regular school classes. Psy 123 is a prerequisite or should be taken concurrently. (3F, Su)

Owens, P. Publicover

191. **Student Teaching in Special Education.** Designed to help the teacher apply methods and techniques found to be successful with slow-learning children, emotionally disturbed children, and culturally disadvantaged. The apprentice plan is followed which requires an initial period of observation with minor responsibilities which increase as the student's ability is demonstrated. Enrollment is limited to experienced teachers or students who have completed Ed 106. Students must have completed or be concurrently taking the courses in Psy 123, 184 or Ed 187 or 291. Credit arranged. (F, W, Sp, Su)

Staff

192. **Field Experience with Exceptional Children.** Opportunities for contracts with retarded, emotionally disturbed, gifted, mentally ill, hard of hearing, deaf and other types of exceptional children will be provided. The candidates will study the settings and work with individuals on specific problems. Internships are provided in approved settings such as Granite School District, Tooele School District, Wyoming State Mental Hospital, Utah State Mental Hospital and other school districts or approved institutions. Credit arranged. (F, W, Sp, Su)

Staff

193. **Psychopathology of Childhood.** A study of pathological behavior in childhood and the role of various professions in diagnosis and treatment of such behavior. (3F, Su)

Casto, P. Publicover

194. **Education of Multiple Handicapped.** (A specialization is being developed in this area). (3Sp, Su)

Owens

195. **Community Relations.** The people, relationships, communication, control channels and processes outside the teacher-pupil relationship which affect the competency of the special educator. (Modes of coping are suggested in the course.) (3W)

R. Publicover

200. **Principles of Learning in Teaching.** See Psychology 200. (3W)

Stone

202. **Psychology of Adolescence.** See Psychology 202. (3Sp, Su)

Staff

213. **Diagnosis of Reading.** See Elem Ed 213. (3F, Su)

Mower

214. **Methods of Instruction in Remedial Reading.** See Elem Ed 214. (3W, Su)

Mower

216. **Practicum in Remedial Reading.** See Elem Ed 216. (3W, Su)

Mower

224. **Characteristics of the Mentally Retarded.** See Psy. 224. (W, Su)

Halstrom, Rickert

## 164 College of Education

225. **Characteristics and Education of the Gifted Child.** See Psy. 225. (3Sp, Su)

Hofmann, Halstrom

225. **Improvement of Reading in the Elementary School.** See Elem. Ed 225.

Allred, Shaw, Mower

225. **Sociology of Deviant Behavior.** See Soc. 225. (3)

Pennock

235. **Theory and Practice of Play Therapy.** See Psy. 235. (3F)

Casto

238. **Practicum in Play Therapy.** See Psy 238. (2W)

Casto

261. **Organization and Administration of Special Education.** See Ed Adm 261. (3F, Su)

Staff

266. **Applied Research in Education.** See Ed. Adm. 266. (3F, Sp, Su)

Shaver

267. **Research in Psychology and Education.** See Ed. Adm. 267. (3F, Sp, Su)

Shaver

282. **Individual Diagnostic Intelligence Testing.** See Psy. 282. (3W)

Frandsen

283. **Reading and Conference.** Provides for individually directed study in subjects of special interest and preparation. Credit arranged. (F, W, Sp, Su)

Staff

285. **Research and Thesis Writing.** Individual work in thesis writing with guidance and criticism. Credit arranged. (F, W, Sp, Su)

Staff

286. **Curriculum and Methods for Gifted Children.** A study of curriculum designs, special and enrichment programs for gifted students. (3Sp, Su)

Halstrom

287. **Basic Problems in Teaching the Mentally Handicapped.** Analysis of the emotional and social aspects of the mentally retarded child as they relate to his perception of himself and of his learning difficulties. The necessity of understanding how these children develop concepts which are essential to their learning will be stressed. Classroom procedures which facilitate the development of such concepts will form the main body of the course. (3Sp, Su)

Owens, Rickert

288. **Counseling and Guidance of Parents of Exceptional Children.** A study of counseling practices suited for parents of exceptional children. The special psychological problems of these parents will be emphasized. Information on local, state, and national resources for parents and children forms an essential part of the course. (3W, Su)

Casto, Halstrom

289. **Diagnosis of the Mentally Retarded.** A study of methods and techniques for educational, psychological, and social diagnosis of the mentally retarded. Prerequisites: Psy. 123, Ed 187. (3W, Su)

Owens, Rickert

290. **Education for Mental Health in the Classroom.** Emphasizes the importance of mental health in teaching. Analysis of the concept of the healthy child in the classroom and the conditions which contribute to his growth and development. (3F, Su)

Publicover, Halstrom

291. **Identification of the Emotionally Handicapped.** A study of symptoms and causes of emotionally disturbed children. Emphasis on recognition of neurotic, psychotic and socially maladjusted children in classroom settings. Prerequisites: Psy. 123, Spec. Ed. 186. (3F, Su)

P. Publicover

292. **Education of Emotionally Disturbed Children—(Elem Ages).** Discussion of school programs for emotionally disturbed children. Methods and procedures for these children in regular classroom, special classrooms and institutions will be studied. Field trips to mental institutions. Prerequisite: Ed 291. (3W, Su)

P. Publicover

293. **Education of the Socially Maladjusted.—(Elem Ages).** Specific emphasis on adolescent programs in institutions such as mental hospitals, industrial schools, etc. Legal and administrative aspects of programs for disturbed adolescents will be discussed. Prerequisites: Spec Ed 291, Psy 202. (3W, Su)

P. Publicover

294. **Seminar in Special Education.** Students draw from all sub-fields in Special Education to study a topic of particular interest and importance. (3W, Sp, Su)

Staff

295. **Methods in Presenting Literature to the Gifted.** Designed to review the characteristics of the gifted, to examine his reading habits, to find methods of identifying superior and creative readers, and to improve upon discussion techniques suitable for elementary and junior high school students. (3W, Sp)

Halstrom

296. **Problems and Methods in Compensatory Education.** How to plan curriculum and use methods and new materials for remediation of the learning problems of the educationally disadvantaged. (3F, Su)

R. Publicover

297. **Seminar on Disadvantaged Children.** A course for teachers and supervisors of disadvantaged children in which the advanced students will study under a team of professors and will do original work in the fields of curriculum, community action programs, tests and measurements, legal and administrative aspects of programs for disadvantaged children. (3Sp)

R. Publicover

298. **Vocational Habilitation for the Mentally Retarded.** A study of methods and techniques in secondary level work-study programs for mentally handicapped adolescents and young

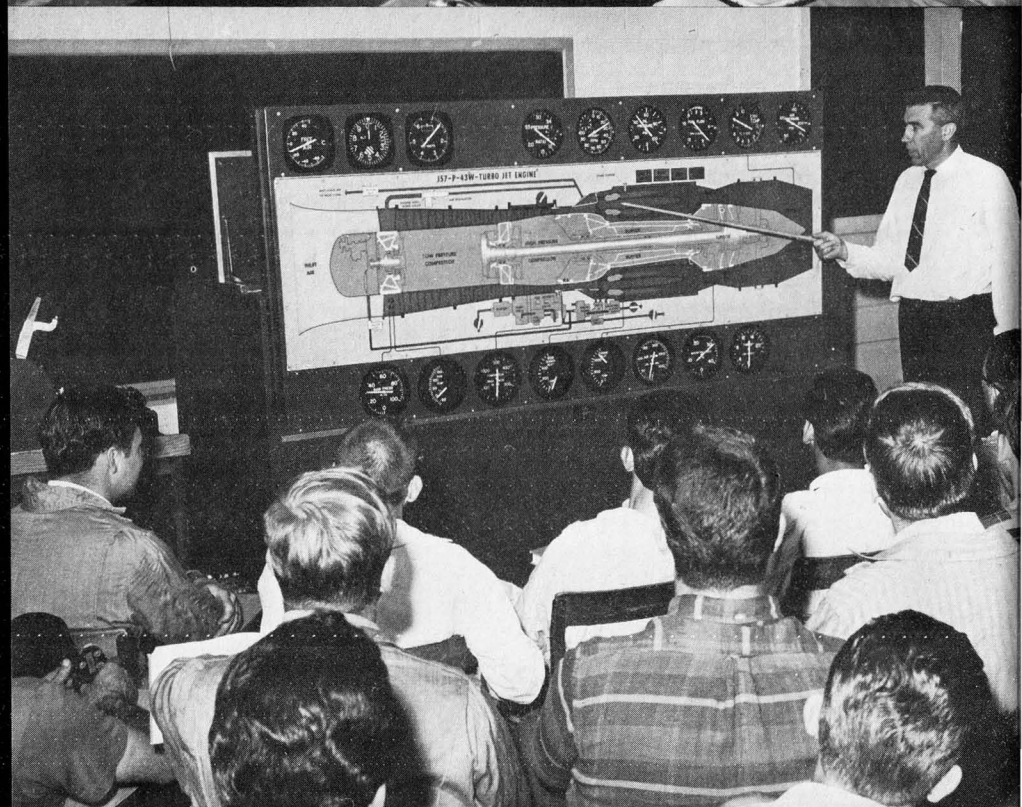
adults. Designed to aid teachers, vocational counselors, and related disciplines in establishing and operating community oriented work-study programs in the secondary schools. (3Sp, Su) **Rickert**

**299. Teaching Language to the Disadvantaged.** Effective methods to teach English to

educationally or culturally deprived children, with emphasis on background material for enlargement of understanding and continued independent study. Provides background for study of generative grammars. Historical changes, psycholinguistics, semantics, and the transfer of theory into plans, materials, practice, and evaluation. (5F) **R. Publicover**











*COLLEGE OF ENGINEERING*

College of

# Engineering

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## Degrees Offered:

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Master of Science

Master of Engineering Science

Master of Industrial Education

Civil Engineer

Irrigation Engineer

Doctor of Philosophy

Doctor of Education in Industrial Education<sup>1</sup>

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<sup>1</sup>Offered jointly with College of Education.

## College of

# Engineering

Dean F. Peterson, **Dean**

Larry S. Cole, **Assistant Dean**

Clayton Clark, **Director, Engineering Experiment Station**

Jay M. Bagley, **Director, Utah Water Research Laboratory**

Glen E. Stringham, **Assistant to the Dean**

Kay Jeppesen, **Controller's Representative**

Office in Engineering C-110B

The College of Engineering offers up to date educational programs for professional development in **Engineering**, in **Industrial and Technical Teacher Education**, and in **Industrial Technology**. Besides providing modern and thorough professional education, the College's curricula are designed to give attention to the liberal aspects of a college experience.

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

The College emphasizes progress, and its program is under constant review and improvement in order for its graduates to become leaders in a society which is rapidly changing technologically and socially. Emphasis is also placed on research and innovation. A large and versatile faculty, more than fifty of whom have doctoral degrees, has been chosen on the basis of teaching and research competence, and professional reputation.

In **Engineering**, degrees lead to employment as professional engineers in such fields as aeronautics, agriculture, astronautics, communications, electronics, high-

ways, hydraulics, industrial engineering, instrumentation, irrigation, machinery, manufacturing, municipal engineering, power, systems, transportation, water supply, etc. In **Industrial Technology**, graduates enter the fields of aeronautics, automotive, and welding as technologists or in management. In **Education**, graduates become teachers of technical and industrial subjects in high schools and technical colleges. Typical minor subjects in the College of Engineering are mathematics and physics.

In **Engineering**, the course of study includes mathematics and basic science, engineering science, engineering analysis and design, basic communications, and humanistic-social studies. A reasonable choice of elective subjects is allowed. If graduate study in Engineering is planned, additional mathematics and physics should be taken.

The objectives of the undergraduate Engineering curricula are to provide thorough, fundamental, technical education necessary for professional Engineering work of the highest grade, and to assure the development of those physical, intellectual, moral, and social qualities essential to high professional achievement. The recommendations of the Engineers' Council for Professional Development have been carefully studied in planning the Engineering curricula, and the cur-

ricula in Civil, Electrical, and Mechanical Engineering are accredited by that agency.

**The Department of Industrial and Technical Education** offers undergraduate degrees in Industrial Teacher Education with majors in Industrial Arts, Technical, and Trade and Industrial Education; also, Industrial Technology with majors in Aeronautics, Automotive, and Welding. The Master of Science and the Master of Industrial Education are offered in Industrial Teacher Education. The Doctor of Education degree in Industrial Education is offered jointly with the College of Education. Certificates of Completion are awarded in Technical Education with majors in Aeronautics, Automotive, Diesel, Drafting and Welding.

The objectives of the Department of Industrial and Technical Education are to provide competent industrial teacher educators for secondary and post high schools, and high-level technical personnel for employment in industry.

**For Industrial and Technical Education**, admission requirements are the same as for general admission to the University.

**For Engineering**, the following high school credits are required for admission without deficiencies: English, 4; Plane Geometry, 1; Algebra, 2; Trigonometry,  $\frac{1}{2}$ ; Physics or Chemistry, 1. One credit each of Physics and of Chemistry and  $\frac{1}{2}$  credit of Mechanical Drawing are recommended. Foreign language in junior or senior high school is desirable. More than four years will be required for deficient students to complete the Bachelor's degree, except that minor deficiencies may be removed by attendance at Summer Quarter. See "Common Freshman and Sophomore Curriculum for Engineering." Students having major deficiencies may be placed

in a pre-Engineering program agreed upon by the Dean. Such students may write to the Dean regarding this program.

**Scholarship.** An average of "C" or higher is required to remain in good standing in the College of Engineering and to be eligible for graduation. For graduation in the College of Engineering a 2.0 average is required in Engineering courses and the supporting courses in mathematics, physics and chemistry required by the department. Courses in the departmental major for which "D" grades are received should be repeated unless otherwise recommended by the department.

The general University scholastic policy governs the College of Engineering. See "Low Scholarship and Probation" in the Registration and Credits section of the catalog. After the first quarter, students may be placed on a warned or probationary status, depending on the degree of the deficiency. Failure to achieve a "C" average after one quarter probation ordinarily results in suspension.

**Graduation.** Candidates for graduation must satisfy the provision of "Graduate Requirements" and "Lower Division Requirements." In addition they must satisfy the requirements of the prescribed curriculum of their major.

Graduates in the professional Engineering programs (Agricultural and Irrigation, Civil, Electrical, Mechanical, and Manufacturing Engineering), also must meet the requirements of the Engineers' Council for Professional Development in the socio-humanistic field. They can do this and satisfy the social science and humanities group requirements of the University by selecting 27 credits from the following groups A and B, with not less than 10 credits in either group:



A) **Social Sciences** (select from two areas) 1) Sociology 70; 2) Economics 51, 52; 3) Psychology 53; 4) Political Science 1 or 10, 15, 70, 101, 102, and 5) History 1, 2, 3, 4, 5, 20.

B) **Humanities** (select from two areas) 1) English—any lower division literature course, any upper division literature course with approval of instructor. 2) Language—any literature course in a foreign language. 3) Fine Arts—Music 1, 101, 102, 103; Theatre Arts 1, 10, 100, 102, 104; Art 1, 10, 35, 36, 37; 4) Philosophy 45, 50, 160. Graduates in the Department of Industrial and Technical Education must meet University group requirements as stated elsewhere in this catalog.

**Engineering College Honors.** An Honors Program provides an opportunity for outstanding students to participate in advanced study or creative investigation beyond the prescribed curricula. See course no. 197 in the departmental listings.

**Professional Societies.** The College holds institutional membership in: American Society for Engineering Education; American Society for Testing Materials; American Concrete Institute; Highway Research Board; and Universities Council on Hydrology.

**Student Chapters or Societies include:** American Society of Civil Engineers; Institute of Electrical and Electronic Engineers; American Society of Tool and Manufacturing Engineers; American Society of Mechanical Engineers; Sigma Tau; Theta Tau; Industrial Education Club; Society of Automotive Engineers; American Welding Society; and Flying Techs-Aeronautics.

**The Engineering Council** comprises representatives from the various student organizations and coordinates student activities. Its

office is Engineering Building, L246.

Students are encouraged to affiliate with appropriate student societies.

**ROTC.** Many Engineering students find satisfaction in serving their country in the Reserve Officers Training Program and as reserve officers after graduation. Junior and Senior ROTC students receive compensation equivalent to a substantial scholarship. See "Military Science and Aerospace Studies." Professor Robert D. Harris, Engineering Building, L284, has been appointed faculty adviser to assist Engineering students desiring to take ROTC to work out schedules.

**Water Engineering.** An integrated graduate program is offered in **Water Engineering** under the departments of Agricultural and Irrigation Engineering and Civil Engineering. See catalog write-up under these departments. Majors are given in **Hydraulic Engineering, Hydrology and Water Resources Engineering, Water Quality Engineering and Irrigation and Drainage Engineering.**

**Master of Engineering Science.** Utah State University cooperates with the University of Utah and Brigham Young University in offering a program leading to the degree of Master of Engineering Science. See "Graduate Studies" in this catalog. Prescribed courses, as outlined below, may be freely exchanged among the three cooperating universities, for this degree only, without restriction. Candidates must satisfy the admission requirements, examination procedure, and all other regulations of the Graduate School except as above amended. The thesis must satisfy the requirements of the student's committee and his thesis director.



Following are the prescribed common courses:

## Engineering Science Curriculum

Common Courses	Credit
Numerical Methods and Computers .....	4
Intermediate Mathematics (Math 140, 141, 142) .....	9
Modern Theoretical Physics (presently Physics 125, 126, 127) .....	12
Engineering Science of Materials .....	3
Advanced Transport Phenomena (ME 210) .....	6
Design Problem or Thesis (ME 298) .....	3-9
Approved Electives (See Master of Engineering Science brochure) .....	2-8

**Scholarships, Fellowships and Assistantships.** A number of scholarships and assistantships are available to Engineering College students, including Freshmen. Interested high school seniors are encouraged to write to the Dean regarding these. See "Awards, Honors, Scholarships, and Grants-in-Aid." There are also opportunities for employment on research projects and other activities.

**Graduate Assistantships and Fellowships.** A number of excellent graduate assistantships, fellowships and scholarships are available in all departments giving graduate work. Assistantships are available both for teaching and research. Application should be made directly to the department concerned. See "Teaching and Research Assistantships."

**Research and Graduate Work.** The College of Engineering maintains an extensive program of research through the Engineering Experiment Station and the various departments. There are opportunities for graduate students to participate, and many undergraduates can find employment in research programs.

**Stewart Radiance Laboratory.** A branch of the USU Electrodynamics Laboratory is maintained at Bedford, Massachusetts, under an arrangement with the Air Force

Cambridge Research Center. This Laboratory is operated by staff members of the Department of Electrical Engineering and the Engineering Experiment Station.

## General Engineering

Students in the Agricultural and Irrigation, Civil, Electrical, Manufacturing, and Mechanical Engineering curricula take the same courses during their Freshman and Sophomore years. Junior and Senior year courses of study are listed under the major departments.

Most of these courses are available every quarter, including Summer.

## General Engineering Courses

1. **Engineering Orientation.** A preview of engineering; what engineering is, what engineers do, what attitudes are essential to success, and philosophy of engineering education. (1F, W) **Peterson**

2. **Slide Rule Instruction.** Practice in the use of the Log-Log slide rule. Prerequisite or concurrently: Math 46. (1F, W, Sp) **Staff**

3. **Digital Computer Utilization for Engineering Students.** Introduction to the use of digital computers in engineering problem solving and data processing utilizing assembly processor languages. Prerequisite: Math 35. (2F, W, Sp) **Staff**

## Common Freshman and Sophomore Curriculum for Engineering

Course	FRESHMAN YEAR			Credits		
	F	W	Sp	F	W	Sp
Math 35, 96, 97, .....	5	5	5			
Chem 20, 21; Physics 20 .....	5	5	5			
English 1, 2, 3 .....	3	3	3			
Mech Engin 21, 22 .....	3	3				
Gen Engin 1, 2, 3 .....	1	1	2			
MS, AS, <sup>1</sup> or PE .....	1	1	1			
Totals .....	18	18	16			

Course	SOPHOMORE YEAR			Credits		
	F	W	Sp	F	W	Sp
Math 98, 99, 110 .....	5	5	3			
Physics 21, 22; Elec Engin 71 .....	5	5	6			
Math 40; Civil Engin 91, 92 .....	3	4	4			
Mech Engin 120 .....		4				
Humanities, Econ 51 .....	5		5			
Totals .....	18	18	17			

<sup>1</sup>Two credits are given for MS or AS.

*Department of*

# Agricultural and Irrigation Engineering

**Head:** Professor A. Alvin Bishop  
Office in Engineering C-213

**Professors** Bruce H. Anderson, Jay M. Bagley, Jerald E. Christiansen, Calvin G. Clyde, Irving S. Dunn, Joel E. Fletcher, Cleve H. Milligan, Dean F. Peterson, Howard B. Peterson; **Professor Emeritus** Orson W. Israelsen; **Associate Professors** Spencer H. Daines, Richard E. Griffin, David Hendricks, Jack Keller, Fred W. Kiefer, Byron C. Palmer, Wayne Ringer, Glen Stringham; **Assistant Professors** S. Abdollah Jenab, Roland Jeppson; **Collaborators** Allen Deitrick, C. W. Lauritzen, Lyman S. Willardson;<sup>1</sup> **Research Engineers** Frank Haws, Earl Israelsen, Donald Jeffs, Gaylord V. Skogerboe.

**Degrees:** Bachelor of Science (BS), Master of Science (MS), Degree of Irrigation Engineer (IE), Doctor of Philosophy (PhD).

**Majors:** Agricultural Engineering, Irrigation and Drainage Engineering, Irrigation Science.

USU has achieved world-wide recognition in Irrigation Engineering. Probably no other engineering college has contributed so much to agricultural engineering and irrigation. Students from all over the world seek admission to this program. USU faculty members in the field are in great demand as consultants and have served in virtually every irrigated country.

A Water Research Laboratory, completed in 1965 at a cost of about \$1,500,000, provides one of the finest facilities of its type in the world.

**Agricultural Engineering** applies the art and science of engineering principles to the solution of agricultural problems. Basic knowledge from almost all fields of engineering is utilized. The Agricultural Engineering curriculum at USU emphasizes irrigation and drainage which draws freely from Hydrology and Hydraulic Engineering.

Because of the strong emphasis on irrigation, drainage, and water resources, the Agricultural and Irrigation Engineering program is closely integrated with Civil Engineering. Many faculty members serve on the staffs of both departments, and graduate programs are jointly planned to utilize the full resources of both departments. (See Civil Engineering for programs in Hydraulic Engineering, Hydrology and Water Resources Engineering, and Water Quality Engineering).

Academic work is supplemented by field trips, which are required as a part of the course work. These field trips provide, under faculty guidance, first-hand study of engineering projects in different stages of completion.

The four-year program listed here leads to the Bachelor of Science degree in Agricultural Engineering (Irrigation and Drainage). A five-year program is available for students with inadequate background to complete it in four years, or for those desiring to take

<sup>1</sup>On leave.

Military Science, competitive athletics, or parttime employment.

This department cooperates with the Department of Soils and Meteorology to offer a BS degree program with a major in Irrigation and Soils. 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 Irrigation and Soils can be found within the Soils and Meteorology Department write-up.

## Undergraduate Study

### Lower Division

Freshman and Sophomore Years  
Common to All Engineers  
(See College of Engineering  
Introduction)

### Upper Division

#### JUNIOR YEAR

Course	Credits		
	F	W	Sp
Civil Engin 103, 105, 106 .....	5	4	4
Civil Engin 140, 141, 142 .....	3	3	3
Civil Engin 84, Elec Engin 105, Civil Engin 181 .....	3	3	3
Mech Engin 111, 112, Engl 113 ....	3	3	3
Civil Engin 173, Humanities .....	4	4	4
<b>Total</b> .....	<b>18</b>	<b>17</b>	<b>17</b>

#### SENIOR YEAR

Course	Credits		
	F	W	Sp
Ag Engin 143, 147, 148 .....	3	3	3
Ag Engin 149, 145 .....	3	4	4
Civil Engin 150, 128, 190 .....	3	3	3
Civil Engin 198 .....	1	1	1
<sup>1</sup> Tech Electives .....	3	3	3
Hum and Civil Engin 195 .....	3	6	3
<b>Total</b> .....	<b>16</b>	<b>16</b>	<b>17</b>

## Graduate Study

The MS and PhD degrees are offered in Agricultural Engineering (Irrigation and Drainage and Wa-

<sup>1</sup>Technical electives may be selected from the following: Agricultural Engineering 108, 146 or 160; Soils 56, 105, 107, 155, 165; Civil Engineering 107, 108, 129, 131, 151, 152, 191, and 193; or approved mathematics or applied statistics.

ter Resources fields), the Professional Engineering degree is offered in Irrigation and Drainage Engineering, and in collaboration with related departments the PhD degree is offered in Irrigation Science.

Curricula and research leading to an advanced degree either on the Master's degree or Doctor's degree level are supervised by a Graduate Committee appointed by the Dean of the School of Graduate Studies. Staff members of the major department and of closely related departments serve on these committees. All study and research programs must be approved by such a committee before admittance to candidacy for an advanced degree. The study and research program for a particular degree must also satisfy all of the requirements listed in this catalog under the School of Graduate Studies.

A diagnostic examination covering the undergraduate engineering subject matter will be given to all entering graduate students. The exam includes mathematics, fluid mechanics, and soil-water-plant relationships for those seeking an MS degree in Agricultural or Irrigation Engineering. The exam includes mathematics and soil-water-plant relationships for those seeking an MS degree in Irrigation Science.

A graduate major leading to the MS and PhD degrees is available in Hydrology or Water Resources. For more information concerning these majors, see the material found in the section of this catalog for the Department of Civil Engineering.

**Irrigation Engineering.** Development of irrigation systems is one of man's oldest engineering endeavors, and it is even more important today than it was centuries ago. Irrigation makes arid land productive and provides great flexibility in cropping patterns,

and thus will be a major factor in solving the world food problem. On the other hand, irrigation is the major consumptive user of water and is probably a major factor in the quality change in the waters of all streams providing irrigation. With the world food problems and water pollution in the spotlight, superimposed on a mounting demand for water by all users—irrigation, power, industry, municipal, culinary, navigation, recreation, fish and wildlife—the challenge facing the irrigation engineer has never been greater and his opportunities and future have never been brighter. In more than 75 years of irrigation engineering experience, Utah State University has attained a world-wide prestige through the successful professional records of its many graduates. A modern, complete and balanced program is available leading to both the MS and PhD degrees, as well as the professional degree of Irrigation Engineer. The MS and PhD degrees are also offered in Irrigation Science in collaboration with related departments.

Irrigation Engineering begins with a basic understanding of the soil-plant-water relationships and includes the design of farm irrigation systems, as well as the design and construction of control, conveyance and distribution works. Proper consideration must be given to pollution problems, along with the economic, administrative, and social problems involved in irrigation development. Irrigation projects often require high dams, long tunnels, canals and pipe lines, and pumping plants. Irrigation projects must be integrated with other water uses. The irrigation engineer must give careful attention to efficiencies of conveyance, application, and consumption of available water. Irrigation engineering training at Utah State

University provides the broad base necessary for proficiency in any or all of these aspects of Irrigation Engineering.

Close interdepartmental association with Soils and Meteorology, Civil Engineering, and Botany is achieved to strengthen the program of those wishing special emphasis in these aspects of the science.

## **Agricultural and Irrigation Engineering Courses**

**10. Irrigation Practice.** Primarily for agricultural students. Principles and practices of efficient use of water, water measurement, farm surveying. Three lectures, one lab. (4Sp)

**Bishop**

**108. Engineering Aspects of Soil and Water Conservation.** Extent and kinds of erosion, rates of water absorption, soil erodibility, vegetation and cultural practices. Erosion control structures, surveys for hydraulic designs for terraces, terrace outlets and soil saving dams. Tillage and farming methods, strip-cropping, erosion and alkali problems on irrigated land. Three lectures, one lab. (4F)

**Stringham**

**110. Irrigation Principles.** Primarily for upper division students in Agriculture and colleges other than Engineering. Surveying, water measurement, conveyance and application, consumptive use of water and water requirements, pumping, drainage, and soil-water relationships. Prerequisite: Math 34. Two lectures, one lab. (3F)

**Keller**

**143. Irrigation Principles.** For advanced engineering students. Soil, water, plant relationships; water requirements; efficiency of water use; flow of water in soil; effects of irrigation on water quality. Prerequisite: Civil Engin 142, or Math 98 and consent of instructor. Two lectures, one lab. (3F)

**Keller**

**145. Surface and Subsurface Drainage.** The application of engineering principles to the design of surface and subsurface drainage facilities including open and covered drains, and drainage by pumping from wells. Soil properties, land reclamation, salinity problems and drain construction. Prerequisite: Civil Engin 142. Three lectures, one lab. (4Sp)

**Christiansen**

**146. Water Conveyance and Control.** Fluid and soil mechanics are applied to problems of water conveyance and control, including canals, flumes, transitions, pipe lines, diversions, drops and chutes, spillways, checks and headgates. Prerequisites: Civil Engin 142, 150; concurrently Civil Engin 106. Three lectures, one lab. (4Sp)

**Stringham**



**147. Sprinkler Irrigation Design.** Design of sprinkler irrigation systems including: sprinkler head types, characteristics and design; pump and pumping plant characteristics and design; sprinkler system planning and layout; economic aspects of design and operation; system maintenance, operation and management. Prerequisites: Ag Engin 143 or Math 98 and approval of instructor. (3W) **Keller**

**148. Design of Farm Irrigation Systems.** Application of engineering principles to the planning and design of farm irrigation systems. Includes open ditch and pipe line distribution systems for application of water by surface methods. Prerequisites: Ag Engin 143 and Civil Engin 142. (3Sp) **Bishop**

**149. Water Law and Institutions.** Laws governing the acquisition, adjudication and administration of water rights, state water codes, interstate compacts, international agreements, federal water laws and legislation, irrigation institutions, conservancy districts, water pollution control districts, state and local organizations. Three lectures. (3F) **Jeffs**

**160. Water Management.** Organization and administration of conservancy districts, metropolitan districts and other water distribution institutions. Distribution of water, financing for construction and operation, maintenance of canals, flumes, pipe lines, dams, regulating reservoirs, and other water facilities. Three lectures. (3W) **Stringham**

**231. Irrigation Science.** Advanced study in irrigation, including such topics as consumptive use of water, soil moisture, irrigation, erosion, infiltration, permeability, potential theory, well hydraulics, and other irrigation engineering principles and practices. (3F) **Bishop, Milligan**

**232. Sprinkler Irrigation Engineering.** Advanced study of sprinkler irrigation design problems such as economic selection of irrigation systems pumps and pumping plant analysis, water hammer and surge, uniformity of application, application rate and intensity, pipe line economics, screening and inlet devices, and special applications of sprinkler methods. (3W) **Keller**

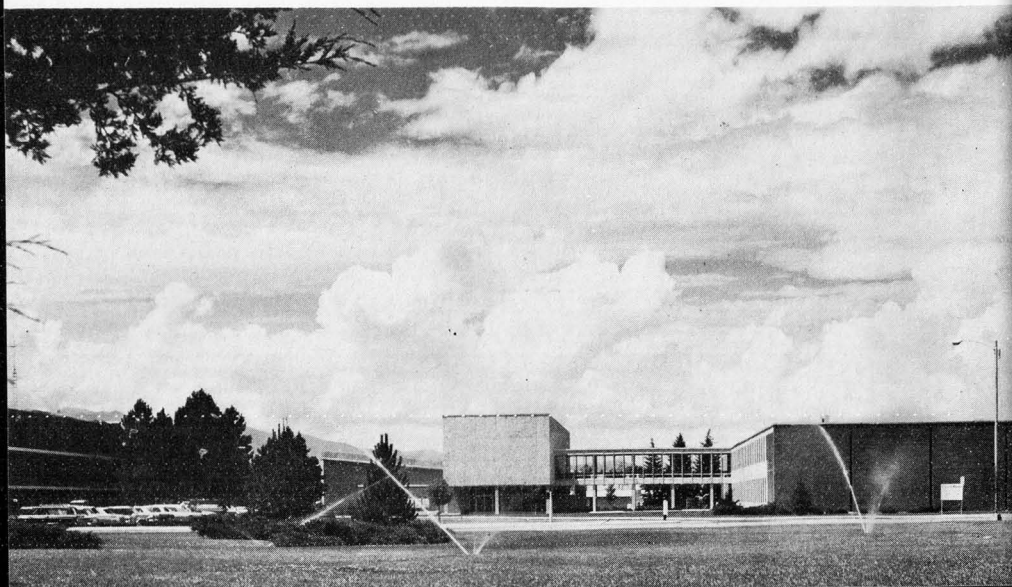
**233. Surface Irrigation Engineering.** Advanced study of concepts utilized in surface irrigation design, such as: hydraulics of flow in furrows, hydraulics of flow in borders, uniformity of application, application efficiency, effects of irregular slopes, use of computers in land leveling calculations, water spreading, land reclamation, and waste disposal. Prerequisites: Ag Engin 148 and Ag Engin 231. (3Sp) **Bishop, Milligan**

**245. Advanced Design of Drainage Systems.** Measurements of field permeability, hydraulics of wells, pumping for drainage, leaching and reclamation of saline soils, etc. (3W) **Bishop**

**273. Special Problems in Agricultural Engineering.** Independent study of chosen problems in Agricultural Engineering. Students are expected to develop initiative in pursuing these problems. Standard, formal typewritten reports required. Credit arranged. (F, W, Sp, Su) **Staff**

**274. Special Studies in Agricultural Engineering.** Special registration for students who have obtained the maximum number of credits for the thesis or Plan B Report and who have not yet completed the writing of the thesis or Plan B Report and who are not registered for any other courses. Credit arranged. (F, W, Sp, Su) **Staff**

**298. Graduate Thesis.** Credit arranged. (F, W, Sp) **Staff**





## Department of

# Civil Engineering

**Head:** Associate Professor Elliot Rich

Office in Engineering L-162

**Professors** J. M. Bagley, A. Alvin Bishop, Jerald E. Christiansen, Calvin G. Clyde, William A. Cordon, Irving S. Dunn, Gordon H. Flammer,<sup>1</sup> Joel E. Fletcher, Cleve H. Milligan,<sup>1</sup> Dean F. Peterson; **Professor Emeritus** Orson W. Israelsen; **Associate Professors** W. O. Carter, Spencer H. Daines,<sup>1</sup> David Hendricks, Norman B. Jones, Fred W. Kiefer, Byron C. Palmer, J. Paul Riley, Glen Stringham, Gary Z. Watters; **Assistant Professors** Vance T. Christiansen, Roland W. Jeppson, Alan Kartchner, Jack Keller, Derle Thorpe; **Research Engineers** Lloyd Austin, Frank W. Haws, A. Leon Huber, Earl Israelsen, Eugene K. Israelsen, Donald R. Jeffs, James H. Milligan, Gaylord V. Skogerboe.

**Degrees:** Bachelor of Science (BS), Master of Science (MS), Doctor of Philosophy (PhD).

**Majors:** Materials and Transportation, Water Supply and Quality Control, Structures, Water Resources (Hydrology), Hydraulics and Fluid Mechanics, Soil Mechanics.

Civil Engineering consists of the economic application of the laws, forces, and materials of nature to the design, construction and operation of engineering works including bridges, buildings, highways, dams, water supply and sewerage systems.

**Civil Engineering** is the oldest of the engineering professions. It first consisted largely of surveying and the building of roads, but through the years has kept pace with the expansion of scientific knowledge and now extends over a broad area of technology. The civil engineer of today is employed by federal, state, county and city governments in addition to every type of private industry. He may design large buildings and dams, municipal water supply systems, super highways with their intricate interchanges, or structural shapes for ballistic missiles, rocket engines, naval vessels and aircraft. He studies automobile and air traffic problems and air pollution problems. He designs and con-

structs chemical and petroleum processing plants and nuclear power installations. Civil Engineering today is truly a broad and dynamically expanding profession.

The curriculum is accredited by the Engineers' Council for Professional Development.

The four-year program listed here leads to the Bachelor of Science degree in Civil Engineering. A five-year program is available for students with inadequate background or those desiring to take Military Science, competitive athletics or parttime employment.

## Undergraduate Study

### Lower Division

Freshman and Sophomore Years

Common to All Engineers

(See College of Engineering Introduction)

### Upper Division

#### JUNIOR YEAR

Course	Credits		
	F	W	Sp
Civil Engin 103, 105, 131 .....	5	4	4
Civil Engin 140, 141, 142 .....	3	3	3

<sup>1</sup>On leave.

Mech Engin 111, 112, Civil			
Engin 84 .....	3	3	3
Engl 113, Civil Engin 181,			
Elec Engin 124 .....	3	3	3
Civil Engin 173, Humanities .....	3	4	5
<hr/>			
Total .....	17	17	18

**SENIOR YEAR**

Course	Credits		
	F	W	Sp
Civil Engin 198 .....	1	1	1
Civil Engin 106, 107, Humanities	4	4	3
Civil Engin 150, 151, 195 .....	3	3	3
Civil Engin 190, 121, 128 .....	3	3	3
Civil Engin 193, Humanities .....	4	3	3
<sup>1</sup> Tech Electives .....	3	3	3
<hr/>			
Total .....	18	17	16

**Water Engineering**

Never in the history of our country has there been more concern with water. Continuing and conflicting demands for water require that the engineer today be trained to handle highly complicated water situations.

USU has a long tradition of training and research in the varied and extensive aspects of water resource development and use. It has developed a well-balanced program, expanded and oriented to provide the training needed to cope with impending water problems of this country and of the world. Teaching and research staff and facilities are continually expanding. The Engineering Building with modern and well-equipped laboratories was completed in 1960. An 80,000 square foot Utah Water Research Laboratory was completed in 1965.

The broad scope of Water Resources Engineering is amply provided in a rich offering of "water" courses in the College of Engineering. Through interdisciplinary collaboration many excellent course

offerings are available in other colleges. A long and continuing tradition of international collaboration in water resource work gives breadth and flavor to the overall program.

The course offerings in Irrigation Engineering in the Agricultural and Irrigation Engineering Department make it possible to enrich each of the following Water Engineering Programs:

**Hydraulic Engineering at Utah State University** encompasses the theory of fluid mechanics and its application in a variety of engineering fields. Fluid mechanics, based on universally valid theorems of energy and momentum, and recognizing no arbitrary boundaries between fields of engineering knowledge, forms a logical core for the Water Engineering program. Various specialties in Water Engineering draw heavily on the fundamentals of fluid mechanics in the solution of hydrology, irrigation, drainage, municipal water and sewerage, and other hydraulic design problems.

A good variety and balance of courses in theoretical fluid mechanics and hydraulic design are available at the upper division and graduate levels.

**Hydrology and Water Resources Engineering** is a fundamental discipline which provides the underpinning for the orderly and unified solution of most water problems.

This hydrologic foundation must be translated into policies, plans, and procedures for optimum development and utilization of the available water supply. Hydrologic considerations must be blended with a substantial body of other engineering, economic, legal, and social information in the formulation of comprehensive multiple-purpose plans. The problems en-

<sup>1</sup>Technical electives may be selected from the following: Civil Engin 108, 120, 122, 129, 130, 132; Ag Engin 143, 145, 146, 147, 148, 149, or approved mathematics, or applied statistics.

countered by the water resource engineer require ingenuity, imagination and skill in engineering applications.

Considerable flexibility in the arrangement of degree programs is permitted in this field. Those with particular interest in scientific or applied hydrology, or in water resources administration, planning, and management, may supplement the strong core of offerings in the Civil Engineering and Agricultural and Irrigation Engineering Departments by choosing from more than 130 approved courses in the departments of Mathematics, Applied Statistics and Computer Science, Economics, Political Science, Business Administration, Geology, Electrical Engineering, Soils and Meteorology, Botany, Sociology, Forest Science, Range Science, Wildlife Resources, and Bacteriology and Public Health.

**Water Quality Engineering.** Within the hydrologic cycle, a relatively fixed supply of water is available for beneficial use. Today's demands for water exceed this available supply. Tomorrow's ever increasing demands indicate that multiple reuse of water is inevitable; thus, water quality control considerations become of paramount importance.

The goal of water quality engineering becomes that of altering or upgrading quality to a level appropriate to the intended use. Water quality changes are accomplished by engineered systems, which include a concern for minimum cost consistent with health, safety and product requirements.

**Irrigation and Drainage Engineering**—See Department of Agriculture and Irrigation Engineering.

**Structural Engineering.** Bridges, buildings of ordinary and unusual nature, structures for aircraft and

space industries, and for a great variety of other purposes, all depend on the structural engineer for their design.

The foundation of Structural Engineering is mathematics, engineering mechanics, mechanics of materials, and properties of materials. This is reinforced with knowledge and experience obtained in design courses.

At a higher level, Structural Engineers study theoretical and applied mechanics and mathematics as a basis for the analysis design of complex structural forms.

**Soil Mechanics.** Engineering studies of soils are concerned with the ability of soils to support structures, roadways and runways, and with the economic application of engineering design to foundations. This science is relatively new, but has developed to a point where no engineer or architect can ignore the problems of investigating properties of soils in connection with engineering construction. Undergraduate and graduate courses offered by the soil mechanics division of Civil Engineering provide the basic knowledge necessary for the design of foundations and acquaint the student with the methods and techniques required to assure safe construction of engineering projects. The program emphasizes fundamental concepts and practical ideas so that the student will be properly trained for his initial job, as well as being prepared to understand future development in this field.

**Materials Engineering.** Effective utilization of the elements of production, space exploration and civil works, and the expanding demand for more impressive bridges, buildings, highways, canals and dams, requires modern engineering materials of increas-

ingly high quality and sophistication. Since materials may represent a large share of the cost of a project, effective and efficient use of materials is of paramount importance.

It is the objective of Materials Engineering to develop effective use of available materials, to take advantage of all new knowledge and, through research and development, contribute to the technical knowledge available. Frequent contributions are made in national and international conferences and publications.

## Graduate Study

This department offers the Master of Science degree in most Civil Engineering fields and the Doctor of Philosophy degree in Fluid Mechanics, Soil Mechanics, Water Resources, Hydrology, Hydraulics, and Structures.

Curricula and research leading to an advanced degree either on the Master's degree or Doctor's degree level are supervised by a Graduate Committee appointed by the Dean of the School of Graduate Studies. Staff members of the major department and of closely related departments serve on these committees. All study and research programs must be approved by such a committee before admittance to candidacy for the advanced degree. The study and research program for a particular degree must also satisfy all of the requirements listed in this catalog under the School of Graduate Studies.

A diagnostic examination covering the undergraduate engineering subject matter will be given to all entering graduate students. The exam includes mathematics, mechanics and strength of materials, fluid mechanics, soil mechanics, and structures. Depending on the candidate's chosen field of study, three or four parts will be taken.

All courses listed above 199 are reserved for graduate students. Undergraduate Senior students who have a high scholastic standing may register for them only with approval of the department.

## Civil Engineering Courses

**65. Engineering Problems.** How to approach the solution of an engineering problem. Application of mathematics to the solution of elementary engineering problems. Prerequisite: Math 110 or concurrently. One lecture and one lab. (2Sp) **Staff**

**81. Plane Surveying.** Primarily for non-engineering students. Use of tape, hand level, level, transit, compass, and plane table. Differential and profile leveling, traversing, plotting, mapping, and care of engineering instruments. Prerequisites: Math 35, 46. One lecture, two labs. (3F, Sp) **Thorpe**

**84. Surveying.** Theory of surveying. Terminology, computations, areas, volumes, field astronomy, and general surveying. Prerequisites: Math 35, 46. Two lectures, two labs. (3F) **Thorpe**

**85. Advanced Surveying.** Problems in leveling, curves, spirals, stadia, plane table, and city surveying. Prerequisite: CE 84. One lecture and two labs. (3Sp) **Thorpe**

**91, 92. Engineering Mechanics.** Statics and dynamics. Includes resultants and equilibrium of force systems, friction, center of gravity, moments of inertia, method of work. Kinematics, force, mass, acceleration, work and energy, impulse and momentum, and vibrations. Prerequisites: CE 2, Math 97, Physics 20. Three lectures and one lab. (4F, W, Sp, Su) **Staff**

**103. Mechanics of Materials.** Stress and strain, centric, torsional and flexural loading deflections, combined loading, columns, repeated and dynamic loadings, connections. Prerequisites: CE 91. Four lectures and one lab. (5F, W, Sp, Su) **Staff**

**105. Elementary Structural Analysis.** Analysis of stresses and deflections in statically determinate structures. Prerequisite: CE 103 or equivalent. Three lectures and one lab. (4W) **Carter, V. Christiansen, Rich**

**106. Elements of Structures.** Principles and practices of reinforced concrete analysis and design. Prerequisite: CE 105 or equivalent. Three lectures and one lab. (4F) **Carter, V. Christiansen**

107. **Elements of Structures.** Principles and practices of analysis and design of steel structures. Prerequisite: CE 105 or equivalent. Three lectures and one lab. (4W) **Carter**

108. **Elementary Structural Design.** Structural Geometry. Design of structures in reinforced concrete, steel and timber; general aspects, details. Special Problems. Office Practice. Prerequisites: CE 106, 107. Three lectures and one lab. (4Sp) **Carter**

120. **Highway Engineering.** Highway systems, planning, economy, finance, location, plans, rights of way, geometric design and roadside development. Prerequisite: CE 84 or 81, Senior standing or Instructor's consent. Three lectures. (3F). **Cordon**

121. **Highway Engineering.** Highway drainage subgrade structure, base courses, bituminous and Portland-cement concrete pavements and maintenance. Prerequisite: CE 150. Three lectures. (3W) **Jones**

122. **Introduction to Traffic Engineering.** Street and highway traffic problems; principles of design and planning of thoroughfares based on operational characteristics; traffic control and regulation. Prerequisite: Senior standing or instructor's consent. Three lectures. (3Sp) **Thorpe**

127. **City Planning.** Master plans, civic units, parks and playgrounds, utilities, housing, subdivisions, zoning, civic centers and airports. Prerequisite: CE 120. Two lectures, one lab. (3Sp). **Staff**

128. **Engineering Materials.** The nature and properties of engineering materials. The influence of atomic arrangement, bonding and crystalline structure on the properties of construction materials. Three lectures. (3Sp) **Cordon**

129. **Engineering Materials.** The properties, requirements and uses of engineering materials in modern construction. Two lectures, one lab. (3W) **Cordon**

130. **Construction Cost Estimating.** Introduction to construction contracting, methods of preparing cost estimates, including an introduction to the Critical Path Method of planning and scheduling construction projects. Prerequisite: Instructor's consent. (3F)

**V. Christiansen**

131. **Indeterminate Structures.** Analysis of stresses and deflections in statically indeterminate structures. Prerequisite: CE 105. Three lectures, one lab. (4Sp)

**Carter, V. Christiansen, Rich**

132. **Indeterminate Structures.** Advanced problems in the analysis of indeterminate structures. Prerequisite: CE 131. Three lectures. (3F) **Carter, V. Christiansen, Rich**

140, 141, 142. **Fluid Mechanics and Hydraulics.** Properties of fluids, the principles of hydro-

statics, flow of ideal and real fluids, principles of similarity, flow of fluids in pipes and open channels, measurement of fluid flow and hydraulic principles underlying the design of turbines and pumps. Prerequisites: Math 110; concurrently GE 3, CE 92. Fall, three lectures; Winter and Spring, two lectures and one lab. (3F, 3W, 3Sp) **Clyde, Jeppson, Watters**

143. **Fluid Mechanics and Hydraulics.** Preparatory course for graduate students majoring in fluid mechanics or irrigation who show inadequate preparation in this area. Subject matter of CE 140, 141, 142 will be covered. This course not accepted as graduate credit in Fluid Mechanics or Irrigation Engineering major. Four lectures. (4F) **Watters**

144. **Applied Hydraulics and Pneumatics.** Theory and practice in hydraulics and pneumatics as they apply to machine tools and controls. Prerequisite: CE 140. Two lectures, one lab. (3W) **Keller**

150. **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. Prerequisites: CE 103, 140. Two lectures, one lab. (3F) **Dunn, Kiefer**

151. **Soils Engineering.** The application of engineering soil mechanics and of structural theory to design of foundations, dams, highways, and other engineering problems. Prerequisite: CE 150 or equivalent. Three lectures. (3W) **Dunn, Kiefer**

152. **Foundation Analysis and Design.** A study of the engineering properties of soils and their effect on the design of footings, pile foundations, cofferdams, caissons, mat foundations and retaining walls. (3Sp) **Kiefer**

165, 166. **Engineering Problems (a and b).** Analysis of Engineering Problems. Application of mathematics to the solution of engineering problems. Prerequisite: Math 110. Three lectures. (3F, 3W) **Dunn**

173. **Hydrology and Meteorology.** The hydrologic cycle, including weather elements and climate, precipitation, evaporation, transpiration, infiltration, ground water, and runoff; methods of collection of hydrologic data and their use in water supply and flood control studies. Prerequisite: CE 141, or instructor's consent. Three lectures, one lab. (4W) **Staff**

181. **Photogrammetry.** The science or art of utilizing photographs of the earth's surface for making surveys, maps, and land utilization studies. Planimetric maps, mosaic and restituted photographs, their construction and uses. Prerequisites: ME 22, CE 81 or 84, or Senior standing in Natural Resources, Geology, Landscape Architecture, Aeronautics, or Advanced Military Science. Two lectures, one lab. (3W) **Thorpe**



**182. Route Surveying.** Theory and practice in highway curves and earth work, including methods used in highway, street, canal, pipe line and general project surveys. One lecture, one lab. (2Sp) **Staff**

**190. Engineering Economy.** Applications of the mathematics of finance and computing techniques to the testing of alternative engineering proposals. Various methods of financing engineering construction. Prerequisites: Econ 51 or Computer Science 11, GE 3, or instructor's consent. Three lectures. (3F) **Cordon**

**191. Water Quality Analysis.** Chemistry of water and waste waters. Principles of solution chemistry with application to water treatment and utilization, waste-water treatment processes, and transformations in natural waters. Prerequisite: Chem 11. Three lectures, 1 lab. (4W) **Hendricks, Fletcher**

**192. Aquatic Microbiology.** See Bact 192.

**193. Municipal Water Supply and Waste Water Disposal.** Introduction to municipal water supply and waste water disposal systems. Prerequisite: CE 142. Three lectures, one lab. (4F) **Jones**

**195. Contracts, Specifications and Engineering Ethics.** Synopsis of the law of contracts. Writing of engineering specifications. Engineering ethics and relationships. Prerequisite: English 111. Three lectures. (3Sp) **Cordon**

**197. Honors Studies.** Advanced work for qualified students. Work is initiated by a 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 credits, arranged. (F, W, Sp) **Staff**

**198. Senior Seminar.** Discussion of engineering subjects. Provides opportunity for both oral and written expression. Talks by visiting engineers. Required of all Civil Engineering seniors. Two lectures. (1F, W, Sp) **Cordon, Rich**

**201, 202, 203. Advanced Structural Theory and Design.** Advanced topics in structural theory including analysis of indeterminate frameworks, model analysis, individual problems in the design of modern structures. Prerequisite: CE 132. Three lectures. (3F, 3W, 3Sp) **Carter, V. Christiansen, Rich**

**210. Earth and Rock-Fill Dams.** Design of flexible type (earth or rock-fill) dams, utilizing naturally available materials. The theories of soil mechanics are used to check designs against criteria for structural stability and stability against seepage. Attention is given to foundations and construction details. Prerequisite: CE 150. (3W) **Clyde**

**211. Masonry Dams.** Design of rigid type dams. Stress analysis and design of gravity, multiple arch, and deck types of masonry dams, timber, steel, and miscellaneous types. Prerequisite: CE 103. (3F) **Riley**

**212. Appurtenances to Dams and Operation of Reservoirs.** Hydraulics and structural design of tunnels, gates, outlet channels, trash racks, etc. Operation of reservoirs for flood control and irrigation. Prerequisite: CE 142. (3Sp) **Staff**

**215. Hydraulic Transients.** Unsteady flow in closed conduits, pipe line surges, water hammer, pulsating flow; unsteady channel flow, channel surges, flood waves. Prerequisites: CE 142, CS 167 or permission of instructor. (3W) **Watters**

**216. Numerical Methods in Fluid Mechanics.** Finite different methods for solving partial differential equations are applied to fluid flow and seepage problems. Transformations are discussed which permit straight forward solutions to both fixed boundary and free-surface problems. Techniques adapted to digital computers are stressed. Prerequisites: CE 241, CS 167, or consent of instructor. Three lectures. (3W) **Jeppson**

**220. Asphalts and Asphalt Mixtures.** The production, classification, physical and chemical properties, and uses of asphalts. Asphalt paving mixtures—properties, design, construction and performance. Prerequisite: Consent of the instructor. Three lectures. (3W) **Jones**

**221. Principles of Pavement Design.** Theories, principles and practices in the design of highway and airport pavements; including soil stabilization, base courses and bituminous and Portland-cement concrete pavements. Prerequisite: CE 220. Three lectures. (3Sp) **Jones, Cordon**

**222. Highway Planning and Economics.** Economics of location and design, selection, improvement and maintenance, traffic control, administration and finance, and jurisdiction as applied to highways. Prerequisite: CE 120. Three lectures. (3F) **Cordon**

**228. Advanced Concrete Engineering.** Basic properties of concrete and concrete materials, including the study of admixtures and pozzolans. Significance of tests and analysis of acceptance tests, performance tests, and control tests. Concrete as a construction material. Prerequisite: CE 128 or equivalent. (3W) **Cordon**

**240. Advanced Fluid Mechanics Lab and Instrumentation.** Experimental investigation of fluid flow phenomena. Design and development of modern laboratory equipment and instrumentation. Prerequisite: CE 142 or 143. (2 to 4F) **Clyde**

**241. Intermediate Fluid Mechanics.** Nature of the fluid state, coordinate systems and fluid motions, Navier Stokes equations, exact and approximate solutions, introduction to potential flow theory, graphical flow nets, boundary layers, turbulence, fluid lift and drag, unsteady flow. Prerequisite: CE 142 or 143. (4W) **Clyde**

**242. Open Channel Flow.** Basic theory of uniform and varied flow in open channels and its application to the design of open channels and open channel control structures for both subcritical and supercritical flow. Prerequisite: CE 241. Three lectures, 1 lab. (4Sp) **Jeppson**

**243. Advanced Hydraulic Design.** Design of pipe lines, special flumes, spillways, water control structures. Prerequisites: CE 142, AE 146. (3Sp) **Staff**

**246. Porous Media Flow.** Darcy's law and the velocity potential, stream function, flow nets, Dupuit flow, complex function theory applied to seepage flow, approximate methods, analogs, seepage from canals, unsteady flow. Prerequisites: CE 141 or 143, Math 141. (3Sp) **Watters**

**250. Advanced Soil Mechanics.** Theories of seepage, capillarity, stress, consolidation, and stability are developed and applied to the practical design and construction of earth structures. Interpretation of laboratory tests is given special attention. Prerequisite: CE 150 or its equivalent. (3Sp) **Dunn**

**251. Advanced Soil Mechanics Laboratory.** Advanced laboratory work in soil mechanics to be arranged with instructor. Prerequisites: CE 150 and 250 (may be taken concurrently). (1Sp) **Kiefer**

**255. Sediment Transport and Alluvial Channel Flow.** Sedimentation problems, sediment transport, channel roughness and design of stable channels. Three lectures, one lab. (4F) **Bishop**

**260. Dimensional Analysis and Similitude.** The application of dimensional analysis and similitude to the solution of a variety of problems in engineering in the fields of fluid mechanics, structural analysis, vibration problems, electrical and other physical phenomena. Applications include design of experiments, interpretation of experimental data, development of equations, theory of models, and use of analogies. Prerequisite: Consent of instructor. (4F) **Watkins, Clyde**

**262. Water Resources Engineering Systems.** Relationship of development of water resources to development of other natural resources. Historical and present concepts in water development. Systems approach to development of water resources. Prerequisite: Consent of instructor. (3F) **Staff**

**263. Water Resources Engineering Institutions.** Current problems and policies with regard to water resource allocation and administration. Institutional factors, interstate and international compacts and commissions, federal valley authorities, coordinating mechanisms, state and federal role in water resource development. Prerequisite: Consent of instructor. (3W) **Staff**

**264. Water Resources Engineering Planning.** General principles and procedures of water resource planning within a regional, multipurpose context, considerations of project formulation, alternative plans, economic and financial analysis. Prerequisite: Consent of instructor. (3Sp) **Staff**

**265. Directed Reading and Special Studies in Civil Engineering.** Investigations into topics of special interest in fluid mechanics, hydrology, water resources, irrigation, structures, highways, soil mechanics or other Civil Engineering specialty. Appropriate direction by staff. Discussion periods are arranged. A final report or examination is required. Prerequisite: Consent of the instructor. Credit arranged. (F, W, Sp) **Staff**

**266. Hydrologic Methods.** Application of mathematical, statistical and graphical techniques to the analysis of hydrologic and climatologic elements. Frequency analysis, spacial comparisons and correlations, extending records, harmonic analysis, curve fitting and smoothing computational aids (including multiple-graphical-coaxial techniques), polar graphs, monographs, electronics analog and digital devices. Prerequisite: CE 173. Three lectures. (3F) **Fletcher**

**267. Flood Hydrology.** Runoff process, hydrologic influences of climatic and physiographic features of watersheds, procedures of estimating runoff from rainfall and snowmelt, runoff hydrograph analyses, infiltration and loss rates, time of concentration and lag, unit hydrograph concepts, storage and flood routing, control methods. Prerequisite: CE 266. Three lectures. (3W) **Fletcher**

**268. Ground Water Hydrology.** Ground water in hydrologic cycle; properties affecting storage and movements; field determination of transmissibility and storage coefficient; ground water basin development and management; ground water inventory; safe yield concept; groundwater recharge and withdrawal; economic, legal and physical considerations; maintenance of groundwater quality; planned utilization and conjunctive use. Prerequisite: CE 173. Three lectures. (3Sp) **Clyde**

**270. Advanced Fluid Mechanics.** Application of the principles and methods of classical hydrodynamics to the solution of fluid flow problems. Prerequisites: CE 241 and Advanced Calculus or Advanced Engineering Mathematics. (3F) **Staff**

**271. Advanced Fluid Mechanics.** Linear and non-linear theory of water waves, jets, selected topics from free surface hydrodynamics. Prerequisite: CE 270. (3W) **Watters**

**272. Advanced Fluid Mechanics.** Turbulence and boundary layers. Prerequisite: CE 271. (3Sp) **Clyde**

**273. Special Problems in Civil Engineering.** Independent or group study of engineering problems not covered in regular course offerings. Time and credit arranged. (F, W, Sp) **Staff**

**274. Special Studies in Civil Engineering.** Special registration for students who have obtained the maximum number of credits for the thesis or Plan B report and who have not yet completed the writing of the thesis or Plan B Report and who are not registered for other courses. Time and credit arranged. (F, W, Sp) **Staff**

**280, 281. Theory of Plates and Shells.** Analysis of stresses and deflections of various shaped plates and shells with applications to aircraft, roofs, tanks, and large pipe lines. Prerequisites: CE 131 or equivalent and Advanced Engineering Mathematics. (3W, 3Sp) **Carter, V. Christiansen, Rich**

**293. Water Quality Management.** Natural and man-made characteristics of water quality, effect of quality on water use planning, water quality requirements in stream pollution control, elements of physical, chemical and biological processes for treatment of water, sewage and industrial wastes. Prerequisite: Consent of instructor. (3F) **Jones**

**294, 295, 296. Water and Waste Water Treatment: Theory and Design.** Theory and design of unit operations and processes for water and waste water treatment. Prerequisite: Consent of instructor. (3F, 3W, 3Sp) **Jones, Hendricks**

**297. Industrial Wastewaters.** The nature of important water using industrial processes is presented, along with the theory, design and application of appropriate unit treatment processes and operations for achieving water pollution control and abatement objectives. Prerequisite: CE 295. One lecture, one lab. (2Sp) **Jones**

**298. Graduate Thesis.** Credit arranged. (F, W, Sp) **Staff**

**299. Graduate Seminar.** (1Sp) **Staff**

## Department of

# Electrical Engineering

**Head: Professor Larry S. Cole**  
Office in Engineering L-150

**Professors** Doran J. Baker, Clayton Clark, Bertis L. Embry, William L. Jones, Bruce O. Watkins; **Associate Professors** Duane G. Chadwick, W. Arnold Finchum, Robert L. Heyborne; **Assistant Professors** Alvin M. Despain, Irvin D. Dunmire, Ronney D. Harris, M. Ray Johnson, Alan W. Shaw, Glen H. Smerage; **Research Engineers** Wayne K. Barlow, Fon R. Brown, Clair L. Wyatt.

**Degrees:** Bachelor of Science (BS), Master of Science (MS), and Doctor of Philosophy (PhD).

**Major:** Electrical Engineering.

The curriculum is accredited by the Engineers' Council for Professional Development.

The four-year program listed here leads to the Bachelor of Science degree in Electrical Engineering. A five-year program is also available for students planning to participate in the advanced mili-

tary program, in athletics, or in parttime employment.

The curriculum provides a balanced program in the fundamental sciences and mathematics, engineering sciences, engineering design, humanities and communication skills. Laboratory work in small groups is an integrated part

of most courses to provide physical confirmation of basic principles and experience with instruments, components and engineering techniques.

Satisfactory completion of the BS program qualifies the student for entrance into the electrical engineering field with professional status.

## Undergraduate Study

### Lower Division

The Freshman and Sophomore common engineering curriculum is listed in the College of Engineering introduction.

### Upper Division

#### JUNIOR YEAR

Course	Credits		
	F	W	Sp
EE 111, 112, 113 .....	3	3	3
EE 114, 115, 116 .....	3	3	3
EE 145, 146, 147 .....	3	3	3
EE 117, 118, 119 .....	2	2	2
English 113, ME 111 .....		3	3
<sup>1</sup> Humanities and/or Electives .....	5	3	3
Total .....	16	17	17

#### SENIOR YEAR

Course	Credits		
	F	W	Sp
EE 175, 176, 177 .....	1	1	1
EE 180, 181, 182 .....	4	4	4
EE 110, 141, 160 .....	4	4	4
<sup>2</sup> EE 151 .....		2	
Tech Electives and/or .....			
<sup>1</sup> Humanities .....	8	6	8
Total .....	17	17	17

## Graduate Study

The basic graduate program in Electrical Engineering includes circuits, waves, and fields, with supporting mathematics and physics. Specialization is available in the fields of antennas and propaga-

<sup>1</sup>Those interested in graduate study should take Math 140, 141, 142, or Math 130, 131, 132 as electives during the Junior or Senior year.

A minimum of 8 credits of technical electives is required, which includes EE 107, 108, 120, 129, 165, 178, 185 and approved mathematics or physics courses.

<sup>2</sup>May be taken Winter or Spring quarter.

tion, control systems, microwave measurements, transistor circuitry and semiconductor physics, communication theory and radiometry.

To be admitted into the EE graduate program, the student should take the Graduate Record Examination, and the examination scores are to be presented with the entrance application. The advanced test in either mathematics, engineering, or physics should be taken, as well as the general aptitude test. A student may be admitted on probation without the advanced GRE test, and this test must then be taken during the first quarter of residence.

The Master of Science degree may be obtained in four quarters, providing the graduate student has had training equivalent to that required for the BS EE, degree at USU. If his training is inadequate, additional undergraduate course work, not credited toward the MS, may be necessary. Either a thesis (six to nine credits) or a plan "B" design or research paper (three credits) is necessary for the MS degree. Graduate EE Seminar is required for three quarters, but these credits (three) will not apply to the total credits (45) specified by the Graduate School. A graduate committee will be appointed for each candidate to plan a specific course of study to meet both degree requirements and interests of the student.

Extended programs of study, in cooperation with the Departments of Physics, Mathematics, and Mechanical Engineering, may lead to the Doctor of Philosophy degree in Electrical Engineering. For further details on graduate study, refer to the USU Graduate Catalog.

## Electrical Engineering Courses

**71. Electric Circuits.** Electrical-circuits, quantities, laws, and functions. Exponential, DC, and sinusoidal steady state behavior. Pole-zero

diagrams, time and frequency domain analysis. Power in AC circuits. Prerequisites: Physics 21 or equivalent, Math 97. Recommended: Concurrent registration in Math 98. Four lectures, one lab. (5F, W, Sp, Su) **Heyborne**

**105. Circuits and Machines.** Generation, transmission and utilization of electric power. Single and 3-phase power circuits. Magnetic circuits, transformers and protective equipment. Introduction to DC and AC machines. Prerequisite: EE 71 or equivalent. Three lectures. (3F) **Embry**

**107. An Introduction to Methods of Electrical Energy Conversion.** Static and dynamic electromagnetic devices used to produce, control, and use electrical energy. Prerequisite: Senior standing in engineering. Three lectures, one lab. (4W, Sp). **Embry**

**110. Transmission Lines.** Basic transmission line theory. High frequency lines, matching stubs and sections. Wave guides and special lines. Prerequisites: EE 113, 116. Three lectures, one lab. (4W) **Harris**

**111, 112, 113. Network and System Theory.** Analysis of linear electrical circuits; time and frequency domains; step, impulse, exponential functions; transfer functions; transients; Fourier and Laplace transforms; network functions; feedback; state space representation. Prerequisites: EE 71, Math 110. Three lectures. (3F, W, Sp) **Embry**

**114, 115, 116. Electromagnetics and Energy Conversion.** Static electric and magnetic fields; Maxwell's equations; dynamic fields; plane waves; radiation; photo, thermo, chemical, mechanical and electrical energy conversion principles and apparatus. Prerequisites (or concurrent registration in): EE 71 and Math 110. Three lectures. (3F, W, Sp) **Shaw**

**117, 118, 119. Electrical Engineering Laboratory.** Electrical Engineering laboratory exercises in measurements, data recording and analysis, instruments, machines, electrical circuits, and devices. Prerequisites: EE 71, ME 120, and GE 3 or equivalent, and concurrent registration in EE 111, and EE 145 series. (Six hours per week.) (2F, W, Sp) **Staff**

**120. Antennas.** Fundamentals of antennas, radiation and wave propagation; directional arrays; feed lines and matching and phasing networks; antenna and field strength measurements. Prerequisites: EE 110, 116. Three lectures, one lab. (4Sp) **Clark**

**124. Electronics.** Principles of tubes and transistors. Basic amplifier and diode circuits and applications. Prerequisite: EE 71. Three lectures. (3F, W, Sp) **Heyborne**

**129. Electroacoustics.** Fundamentals of architectural acoustics; theory and principles of electro-mechanical transducers, including loud speakers, microphones and vibration pickups; recording methods and equipment; measurement techniques in acoustic and electro-mechanical systems. Prerequisites: EE 113, 147. Three lectures, one lab. (4F) **Cole**

**141. Microwaves.** Microwave generators and microwave measurements; cavity resonators; radiators; applications of ferrite and semiconductor materials to microwave systems for isolation; parametric amplification, detection, and frequency multiplication. Prerequisites: EE 110, 116. Three lectures, one lab. (4Sp) **Shaw**

**145, 146, 147. Materials and Electronics.** Electronic materials; construction and characteristics of electronic devices; circuit models. DC and AC operating conditions; small and large signal analysis; feedback circuit applications. Prerequisite: EE 71. Three lectures. (3F, W, Sp) **Johnson**

**151. Design.** For Seniors only. Individual engineering assignments involving design, development, construction and testing of various types and units of electronic and communications equipment. A formal engineering report is required of each project. Two labs. (2F, 2W, 2Sp, 2Su) **Cole**

**160. Feedback Control.** Introductory theory and analysis of linear closed-loop control systems. Study of servomechanism systems containing electronic, electro-magnetic and mechanical components. Prerequisites: EE 71, Math 110, and Senior standing. Three lectures, one lab. (4Sp) **Watkins**

**165. Analog Computers.** Application of analog methods to the solution of engineering problems; principles of integrators, multipliers, function generators; time and amplitude scale factors. Prerequisite: Math 110. Two lectures, one lab. (3F, W) **Embry**

**175, 176, 177. Electrical Engineering Seminar.** A weekly meeting of staff and Senior EE majors. Reports and discussions on recent developments in electronics and communications. Each student prepares and presents technical papers on suitable topics. (1F, 1W, 1Sp) **Staff**

**178. Switching Circuits.** Number systems (decimal, binary, octal, etc.); Boolean algebra (postulates, theorems, applications to switching design, etc.); logic circuit blocks (AND, OR, NAND, NOR, etc.); logic design of switching networks; simplification methods (tabular, map, etc.). Prerequisite: Upper division standing. Three lectures. (3F, W) **Dunmire**



180, 181, 182. **Analysis and Design of Electronic Circuits.** Review of transistor physics, DC operating point and stability, transistor models, small-signal single-stage amplifiers. Thermal and reliability problems. Large-signal amplifiers, multistage amplifiers, low-pass amplifiers, band-pass amplifiers, DC amplifiers. High frequency effects, noise problems, feedback sinusoidal oscillators. Piecewise linear analysis of non-linear circuits, transistor switching, regenerative switching circuits. Modulation and detection, clippers, clampers, linear slope generators. Design of switching circuits including saturated mode, current mode and avalanche mode circuits. Magnetic cores, diode switching. Prerequisites: EE 112, 119. Three lectures, one lab. (4F, 4W, 4Sp) **Fincham**

185. **Introduction to Semiconductor Device Theory.** Basic principles of semiconductor theory; semiconducting materials; p-n junction theory, survey of new devices. Prerequisite: senior or graduate standing. (3F, Sp) **Jones**

197. **Honors Studies.** Advanced work for qualified students. Work is initiated by a 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 the instructor and approval of the College of Engineering Honors Committee. This course may be repeated. 1-3 credits, arranged. (F, W, Sp) **Staff**

201, 202, 203. **Quantum and Solid State Electronics.** Wave mechanics of electrons in metals and semi-conductors. Band theory of solids. Theory of electrical conductivity. Dielectric, magnetic and galvanomagnetic properties of materials. Energy transitions and transition probabilities. Elements of maser theory and quantum detectors. Three lectures. (3F, 3W, 3Sp) **Jones**

208. **Advanced Energy Conversion.** Direct energy conversion methods. Thermionic, thermoelectric, photoelectric, piezoelectric, magneto-hydrodynamic, chemical cells, and other related topics. Prerequisite: Senior or graduate standing in Engineering. Three lectures. (3Sp) **Embry**

211. **Amplifier Circuit Theory.** Gain and stability analysis of tuned transistor amplifiers; design of filter amplifiers using feedback techniques; low noise amplification. Prerequisite: EE 185 (4W) **Jones**

212. **High-Speed Switching Devices and Circuits.** Semiconductor device transient analysis, the relationship of circuit switching properties to device physics. Prerequisites: EE 185, 245. (4Su) **Jones**

215, 216, 217. **Theory of Linear Systems.** Delta functions and distributions. Vectors, matrices, linear transformations. State space, state equations, input-output-state rela-

tions. Time-invariant and time-varying linear systems. Devices described by systems of linear differential equations. Nondifferential systems. Discrete-time systems. Stability. Fourier, Laplace, and Z transforms. Signal flow graphs. Controllability and observability. Three lectures. (3F, 3W, 3Sp) **Watkins**

222, 223, 224. **Network Analysis and Synthesis.** The mathematical analysis and design methods for two and four terminal passive networks having physically realizable driving point and transfer immittances. Analysis and design of networks with active elements. Multiport networks; analysis and synthesis using linear vector methods. Prerequisites: EE 113 and GE 3 or CS 167 or concurrent registration in GE 3 or CS 167. Three lectures. (3F, 3W, 3Sp) **Jones**

231, 232, 233. **Electromagnetic Fields and Waves.** Advanced static and dynamic electric, current, and magnetic field theory; Maxwell's equations; wave equations; solution of electromagnetic field and wave problems in coordinates appropriate to various wave structures; nonclassical electrodynamics. Prerequisite: EE 116 or Physics 175. Three lectures. (3F, 3W, 3Sp) **Baker**

235. **Introduction to Radio Wave Propagation.** Radio wave transmission through dielectric and ionized mediums. Calculation of effects of reflection and absorption of radio waves from the earth's ionosphere with practical problems encountered in long distance communication. Introduction to magnetospheric theory. Prerequisite: EE 116 or equivalent. (3Su) **Heyborne, Clark**

236. **Advanced EM Propagation.** Electromagnetic wave propagation in a space containing free electrons and a constant magnetic field. Three lectures. (3F, W) **Heyborne, Clark, Harris**

237. **Magnetospheric Studies.** Electromagnetic wave propagation in dispersive anisotropic media with applications to the earth's ionosphere and magnetosphere. Three lectures. (3W, Sp) **Heyborne, Clark, Harris**

238. **Selected Reading in Radio Science.** Lecture arranged. (2F, W, Sp) **Clark**

239. **Selected Reading in Radio Science.** Lecture arranged. (2F, W, Sp) **Clark**

240. **Microwave Measurements.** Theory and practice in measurement of impedance, power, frequency and wave length at frequencies above 500 mc. Oscillators and detectors will be studied along with the characteristics of certain types of transmission lines and associated equipment in the microwave region. Prerequisites: EE 116, 141 or equivalent. One lecture, one lab. (2Su) **Clark**

**242, 243, 244. Applied Plasmadynamics.** Characteristics of the plasma-state and plasma generation; velocity distribution functions, collisions and Boltzmann equation: orbit theory oscillations and wave modes in a plasma; transport theory; propagation of electromagnetic waves in plasma; plasma devices. Prerequisites: EE 114, 115, 116 or equivalent. (3F, 3W, 3Sp)

**Harris**

**245. Transistors and Integrated Circuits.** Transistor theory, transistor characteristics, and fabrication techniques used in integrated circuits. (3Sp)

**Jones**

**251, 252. Feedback Control Systems.** Analysis, synthesis and compensation of automatic feedback control systems. Advanced linear theory. Sampled data control systems. Non-linear analysis, stochastic signals and control. Theory of optimal control. Adaptive systems. Prerequisite: EE 160 or equivalent. Three lectures. (3W, 3Sp)

**Watkins**

**261. Space Science and Engineering.** A survey course covering aerospace environment; orbital mechanics; vehicles and propulsion systems; instrumentation and communication systems; power sources; satellites; space exploration. Prerequisites: Physics 22, Math 110. (2W)

**Barlow**

**265. Particle Interactions.** Collision phenomena in ionized gases; elastic scattering in central force field; scattering cross sections; ionization, excitation, and charge transfer by electron and ion impact; photoabsorption; negative ions; mobility and diffusion of electrons and ions; electronic energy distributions and drift velocities; recombination; surface phenomena; plasmas. Three lectures. (3F)

**Brown**

**273. Special Problems in Electrical Engineering.** Independent or group study of engineering problems not covered in regular course offerings. (Time and credit arranged.) (F, W, Sp, Su)

**274. Special Studies in Electrical Engineering.** Special registration for students who have obtained the maximum number of credits for the thesis or Plan B Report and who have not yet completed the writing of the thesis or Plan B Report and who are not registered for other courses. (Time and credit arranged.) (F, W, Sp, Su)

**275, 276, 277. Graduate EE Seminar.** A weekly meeting of staff and graduate EE students. Each student prepares and presents technical papers on suitable topics. One lecture. (1F, 1W, 1Sp)

**Staff**

**278. Seminar in Radio Science.** One lecture. (1F, W, Sp)

**Clark**

**281. Radiometry.** Principles of thermal emission, transmission and detection of radiant energy; detection and measurement systems. Prerequisites: Physics 22, Math 99, and EE 119. Three lectures. (3Sp)

**Wyatt**

**285. Introduction to Statistical Optics.** Fourier transform theory, sampling theorems, two-dimensional Fourier analysis. Scalar diffraction theory, Fraunhofer diffraction. Optical imaging and Fourier analysis, coherent and incoherent light, optical systems as filters of spatial frequency, spread function and contrast transfer function, optical systems with lenses. Elements of probability theory and random processes. Spectral analysis. Processing of optical data. Resolution. Three lectures. (3F)

**Despain**

**291, 292, 293. Statistical Communication Theory.** Statistical nature of the communication process. Random processes, time and statistical averages, Fourier analysis, spectral theory, sampling. The effects of linear and nonlinear data processing on the statistical properties of signals. Wiener filters, matched filters, applied statistical decision theory. Introduction to classical information theory—quantitative definition of information, coding, Shannon's theorem. Three lectures. (4F, 4W, 4Sp)

**Smerage**

**298. Graduate Thesis.** Credit arranged. (F, W, Sp)

**Staff**

Department of

# Industrial and Technical Education

(Industrial Teacher Education, Industrial Technology, Technical Education)

**Acting Head:** Associate Professor Neill C. Slack  
Office in Mechanic Arts 102

**Professors** Carl R. Bartel,<sup>1</sup> Austin G. Loveless, William E. Mortimer; **Associate Professors** Edward L. France, Charles W. Hailes, Owen Slaugh, Lowell P. Summers, Lynn R. Willey; **Assistant Professors** James R. Heggen, Ralph E. Long, Edmund J. Mannion, Samuel W. Merrill, Loren L. Palmer, Von H. Robertson, Carl R. Wallis, J. LaMar Wright; **Instructors** Byron Dansie, Leon M. Hill, Marlin D. Johnson; **Lecturer** Harold M. Wadsworth.

**Degrees:** Two-year Certificate of Completion in Technical Education, Bachelor of Science (BS), Master of Science (MS), Master of Industrial Education (MIE), Doctor of Education (EdD).

**Majors:** Industrial Arts Teacher Education, Technical Teacher Education, Vocational (Trade and) Industrial Teacher Education, Aeronautical Technology, Automotive and Diesel Technology, Welding Technology.

American industry has expanded at a rate which defies description in the past two decades. This expansion has created a dynamic, fast changing society and economy with unlimited opportunities. The need for well educated industrial and technical personnel has always been great, but has now become essential to our national economic and social well-being.

The Industrial and Technical Education Department offers a series of programs designed to provide training for professions in a wide spectrum of the industrial and technological world. Qualified and experienced staff members have been assembled to develop and incorporate new ideas from their fields into this progressive area.

The facilities for this program include 51,000 square feet of floor

space in two buildings containing laboratories with equipment specifically designed for instruction in welding, electricity-electronics, automotive - diesel, aeronautics, woods, metals, plastics, graphic arts, and drafting. Nearing the construction phase is a new Industrial Science building which will further augment the program, with over 28,000 square feet of the most recent industrial and technical laboratory facilities.

Graduates of the various programs are employed in top-level positions in industry and education. To continue meeting the growing demand for graduates, the department offers programs in Industrial Teacher Education, Technology and Technical Education. In cooperation with the College of Education, master's and doctor's degrees are offered in Teacher Education.

<sup>1</sup>On leave

The organizational pattern of this department is quite complex. The following may help the student to understand it:

There are two Bachelor of Science degree programs, each with a choice of three majors and one of these also offering a minor. There is also a Two-Year Certificate program, with a choice of four specializations:

A) BS program in Industrial Teacher Education, with a choice of:

- 1) Major in Industrial Arts Teacher Education
- 2) Major in Technical Teacher Education
- 3) Major in Vocational (Trade and) Industrial Teacher Education
- 4) Minor in Driver Education

B) BS program in Industrial Technology, with a choice of:

- 1) Major in Aeronautical Technology
- 2) Major in Automotive and Diesel Technology
- 3) Major in Welding Technology

C) Two-Year Certificate program in Technical Education, with a choice of four specializations:

- 1) Aeronautics
- 2) Automotive
- 3) Drafting
- 4) Welding

For convenience, the courses in this department are grouped under the following nine categories: General, Aeronautics, Automotive, Drafting, Electricity-Electronics, Metals, Welding, Woods, and Professional (Teacher Education).

## Undergraduate Study Industrial Teacher Education

The increased emphasis on preparing youth for the industrial society and the world of work, and

for the upgrading and retraining of workers to meet modern industrial processes, has placed a new importance upon the need for trained teachers of Industrial Arts, Industrial Vocational, and Technical Education. The demand is great for the trained teacher in both the public school system and in industrial training programs.

The Industrial Teacher Education program offers professional training throughout the entire school year, including Summer Quarter, both on and off campus. Completion of the curriculum leads to the degrees of Bachelor of Science in Industrial Teacher Education, with majors in Industrial Arts Education, Vocational Industrial Education, and Technical Education.

**Industrial Arts Teacher Education Major** prepares one to teach in junior and senior high school positions. The curriculum is designed to meet State Certification requirements.

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 courses in education and psychology.

Courses emphasize laboratory skills and technical knowledges included in basic American industries. The curriculum also includes courses in the arts, sciences, education, and professional Industrial Education. The Industrial Teacher Education curriculum with a major in Industrial Arts Teacher Education is as follows:

### Industrial Arts Teacher Education Major FRESHMAN YEAR

Course	Credits
Technical Sequence (Wood) 61, 62, 63	9
English 1, 2, 3	9
Math 34, 44	6

Technical Sequence (Drafting 80, 81, 82)	9
Humanities or Sociology and Behavioral Science	3
Humanities	9
ITE 1	1
PE	3

Total ..... 49

#### SOPHOMORE YEAR

Course	Credits
Natural Science Chemistry 10 and Physics 6	10
Biological Science Physiology 4	5
Technical Sequence (Metal) 40, 50, 51	9
Social and Behavioral Science Group (Psychology 53) (Economics 51)	10
Speech 21	3
Technical Sequence (Electron) 71, 72	6
Industrial Crafts 90	6
Electives	6

Total ..... 55

#### JUNIOR YEAR

Course	Credits
Psychology 100, 102	6
Public Health 155	3
Education 126, 150	6
Adv. Technical Sequence	15
ITE 83, 92	6
Elective (Minor)	3
Power Mechanics	6
Graphic Arts	3

Total ..... 48

#### SENIOR YEAR

Course	Credits
ITE 101, 104, 196	7
ITE 193	3
ITE 194	9
ITE (102, 195)	6
Adv. Technical Sequence	6
Elective (Minor)	15

Total ..... 46

**Trade and Industrial Teacher Education Major** prepares one to teach in high school and post high school Trade and Industrial programs. A candidate for the degree must show evidence of successful occupational experience in the specific area in which he is preparing to teach. As part of the degree requirement, a student must meet the occupational experience requirement as stated in the State Plan of the State Board for Vocational Education. The curriculum is designed to meet State Certification requirements. The Industrial Teacher Edu-

cation curriculum with a major in Trade and Industrial Teacher Education is as follows:

#### Trade and Industrial Teacher Education Major

##### FRESHMAN YEAR

Course	Credits
Trade Courses	9
English 1, 2, 3	9
Math 34, 35, 44	11
Approved Elective	6
Humanities Group	9
ITE 1	1
PE 1, 16 & elective	3

Total ..... 48

##### SOPHOMORE YEAR

Course	Credits
Trade Courses	12
Physics 17, 18, 19 or Physics 6, Chemistry 10, 11	15
Biological Science	5
Sociology and Behavioral Science Group (Economics 51) (Psychology 53)	13
Speech 21	3
Elective	3

Total ..... 51

##### JUNIOR YEAR

Course	Credits
Adv. Trade Courses	17
Hum/Soc Sci Group	3
Psychology 100 or 106	3
Public Health 155	3
Education 150	3
English 113	3
Approved Electives (minor)	18

Total ..... 50

##### SENIOR YEAR

Course	Credits
Adv. Trade Courses	12
ITE 104, 101, 196	7
ITE 102, 193	6
ITE 194	9
ITE 195	3
Approved Electives (minor)	9

Total ..... 46

**Technical Teacher Education Major.** A major in Technical Teacher Education prepares one to teach in high school and post high school technical programs. A candidate for the degree must show evidence of successful occupational experience in the specific technical area in which he is preparing to teach. As part of the degree requirement, a student must



meet the occupational experience requirement as stated in the State Plan of the State Board for Vocational Education. The curriculum is designed to meet State Certification requirements. The Industrial Teacher Education curriculum with a major in Technical Teacher Education is as follows:

**Technical Teacher Education Major  
FRESHMAN YEAR**

Course	Credits
Technical Courses .....	9
English 1, 2, 3 .....	9
Math 34, 35, 46 .....	11
ITE 80, 1 .....	4
Humanities Group .....	6
GE 2 .....	1
Approved Elective (minor) .....	6
PE, AS or MS .....	3
<b>Total .....</b>	<b>49</b>

**SOPHOMORE YEAR**

Course	Credits
Technical Courses .....	15
Physics 17 .....	5
Biological Science .....	5
Chemistry 11, 12 or Physics 18, 19 .....	10
Social and Behavioral Science Group (Economics 51) (Psychology 53) .....	10
Chemistry 10 .....	5
<b>Total .....</b>	<b>50</b>

**JUNIOR YEAR**

Course	Credits
Advanced Technical Courses .....	15
Speech 21 .....	3
Psychology 106, Education 150 .....	6
English 111, Mfg. E. 148 .....	6
Approved Electives (minor) .....	6
ITE 191, 71 .....	6
Humanities Group .....	6
<b>Total .....</b>	<b>48</b>

**SENIOR YEAR**

Course	Credits
Advanced Technical Courses .....	12
ITE 102 .....	6
ITE 193, 194 .....	6
ITE 195, 196 .....	6
Approved Electives (minor) .....	15
<b>Total .....</b>	<b>45</b>

## Industrial Technology

Modern technology has created many challenging careers that can be undertaken by the graduates of four-year programs in Aeronau-

tics, in Automotive and Diesel, and in Welding Technology. A Bachelor's degree in any of these three programs can lead to high-level industrial technologist, supervisory and managerial positions in industry. Excellent foundation is provided for entrance into Civil Service positions and for private business and industry. One of the fastest growing needs in industry is for the technologist. Graduates of these programs are in great demand now and will be in the foreseeable future.

## Aeronautics Major

A major in Aeronautics prepares one to enter the Aero-space industry as a high-level technician and to assume responsible supervisory and administrative positions in maintenance management, transportation research, and design, with opportunities in the missile industry. The Aeronautics Technology curriculum is fully certified with Air Agency, complying with Federal Aviation Agency regulations.

Students desiring to enter industry in technical maintenance fields should successfully accomplish the written and practical FAA examinations of the Air Frame and Power Plant rating. The four-year Technology curriculum with a major in Aeronautics is as follows:

**Aeronautics Major  
FRESHMAN YEAR**

Course	Credits
ITE 5, 6, 7 .....	9
ITE 5a, 6a, 7a .....	9
Mathematics 34, 35, 46 .....	13
English 1, 2, 3 .....	9
Economics 51, ITE 51 .....	8
ITE 1, 48 .....	4
MS, AS, or PE .....	3
<b>Total .....</b>	<b>55</b>

**SOPHOMORE YEAR**

Course	Credits
ITE 8, 9, 10 .....	12
ITE 8a, 9a, 10a .....	12
ITE 80, 81, 82 .....	9

Physics 17, 18, 19 .....	15
ITE 71 .....	3
General Engineering 2 .....	1
<b>Total</b> .....	<b>52</b>

#### **JUNIOR YEAR**

<b>Course</b>	<b>Credits</b>
ITE 106, 108, 114 .....	10
ITE 117, 118, 119 .....	9
English 113 .....	3
Chemistry 10, 11 .....	10
Economics 170 .....	5
Humanities Elective .....	7
Approved Electives .....	8
<b>Total</b> .....	<b>52</b>

#### **SENIOR YEAR**

<b>Course</b>	<b>Credits</b>
ITE 105, 107, 111 .....	9
ITE 112, 113, 135 .....	9
ITE 109, 110, 192 .....	9
Mfg. Engineering 148, 150, 180 .....	10
Speech 105 .....	3
Political Science 101, 102 .....	6
Biological Elective .....	5
<b>Total</b> .....	<b>51</b>

### **Automotive and Diesel Major**

A major in Automotive and Diesel prepares one to obtain industrial positions which are directly or indirectly related to Automotive and Diesel, and to assume responsible supervisory and administrative positions in such industries.

A successful graduate of this program will be a well-qualified high-level technician capable of interpreting the designs of engineers and directing the work of skilled craftsmen. The four-year Technology curriculum with a major in Automotive and Diesel is as follows:

#### **Automotive and Diesel Major**

##### **FRESHMAN YEAR**

<b>Course</b>	<b>Credits</b>
English 1, 2, 3 .....	9
Mathematics 34, 35, 44 .....	11
ITE 27, 28, 29 .....	12
ITE 80, 81, 82 .....	9
ITE 41, 44, 71 .....	9
ITE 1 .....	1
MS, AS, or PE .....	2
<b>Total</b> .....	<b>53</b>

#### **SOPHOMORE YEAR**

<b>Course</b>	<b>Credits</b>
ITE 24, 25, 26 .....	13
Chemistry 10, 11 .....	10
Biology 1 .....	5
Sociology 70, Economics 51 .....	10
Humanities .....	3
ITE 22, 37, 51 .....	10
MS, AS, or PE, GE 2 .....	2
<b>Total</b> .....	<b>53</b>

#### **JUNIOR YEAR**

<b>Course</b>	<b>Credits</b>
ITE 125, 126, 127 .....	9
Physics 17, 18, 19 .....	15
ITE 191, 192, 135 .....	10
Humanities Group .....	6
Approved Electives .....	3
ITE 121 .....	3
Business Administration 100, 133 .....	7
<b>Total</b> .....	<b>53</b>

#### **SENIOR YEAR**

<b>Course</b>	<b>Credits</b>
ITE 122, 123 .....	6
English 113 .....	3
Speech 105 .....	3
Mfg Engineering 150, 148 .....	7
ITE 128, 124, 132 .....	9
Economics 125, Humanities .....	6
Approved Electives .....	13
<b>Total</b> .....	<b>47</b>

### **Welding Major**

A major in Welding prepares one to enter industry in which highly technical welding skills and knowledge are required.

A successful graduate of this program will be a well-qualified high-level technician in all phases of Welding Technology. The four-year Technology curriculum with a major in Welding is as follows:

#### **Welding Major FRESHMAN YEAR**

<b>Course</b>	<b>Credits</b>
ITE 40, 41, 44 .....	9
English 1, 2, 3 .....	9
Mathematics 34, 35, 44 .....	11
ITE 80, 81, 82 .....	9
ITE 1, General Engineering 2 .....	2
MS, AS or PE .....	3
Humanities/Social Science .....	9
<b>Total</b> .....	<b>52</b>

#### **SOPHOMORE YEAR**

<b>Course</b>	<b>Credits</b>
ITE 51, 52, 45 .....	9
Chemistry 10, 11 .....	10
ITE 71, 72, 73 .....	9

## 194 College of Engineering

Physics 17, 18, 19 .....	15
Economics 51 .....	5
Total .....	48

### JUNIOR YEAR

Course	Credits
ITE 175 .....	3
Speech 105 .....	3
Mfg. Engineering 137, 140, 148 .....	9
English 113 .....	3
Biological Science .....	5
ITE 141, 146, 149 .....	9
Humanities/Social Science .....	11
Electives .....	3
ITE 143, 144 .....	6
Total .....	52

### SENIOR YEAR

Course	Credits
ITE 141A, 149A, 148 .....	9
ITE 144A, 145 .....	6
ITE 192, 142, 191 .....	9
Electives .....	21
Total .....	45

## Two-Year Technical Education

Programs in Technical Education provide university training of a non-degree nature. It is designed to prepare persons to enter into modern industry as technicians.

The completion of the two-year Technical Education curriculum leads to a Certificate of Completion in one of the following areas of specialization: Aeronautics, Automotive, Drafting, and Welding. Qualified students may apply most of the credits earned under this program toward a degree at a later date.

Students interested in this program should contact the Industrial and Technical Education Department Head.

### Driver Education Minor

The Driver Education minor is administered and approved by the Industrial and Technical Education Department. The minor is designed to meet State Driver Education Certification requirements.

A minimum of twelve credits are required in the area of Driver and Safety Education. Also a minimum of six credits are required in related safety work. An approved minor consists of twenty-four credits. Check with department advisers for approved courses.

## Graduate Study

Two types of Master's degree programs are available to students doing graduate work in the Department of Industrial and Technical Education. These programs are the Master of Science degree in Industrial Education and the Master of Industrial Education degree.

The Doctor of Education degree in Industrial Education is available to those students who desire to do advanced work beyond the Master's degree. This degree program is designed for professional instructors in the field of Industrial Arts, Technical, and Trade and Industrial Education. The Doctor of Education degree in Industrial Education is an interdisciplinary degree program administered jointly by the College of Education and the College of Engineering.

The degree programs are sufficiently flexible to meet the needs of individuals engaged in the various phases of Industrial Education work. Candidates are given assistance in planning a program which will provide them with technical and professional development considered essential. For information on the programs for these degrees, see the Graduate School Catalog.

## Industrial and Technical Education Courses

1. **Orientation.** The study of the various occupational opportunities in Industrial and Technical Education, including the necessary preparation for entrance into these occupations. (1F, W) **Staff**

**2. Applied Shop Mathematics.** Simple mathematical formulas are used in solving problems in mechanical work. These include speed ratios, steel square, micrometer reading, and area and volume problems. (3F, Sp) **Mortimer**

**3. Building Maintenance.** Discussion of materials used in maintaining modern school buildings and their proper use. Required of all persons doing parttime custodial work on campus. Two lectures, lab arranged. (3F, W, Sp) **Wadsworth**

**90. Industrial Crafts.** Basic craft materials, processes and applications in educational and recreational programs. (3F, Sp) **Staff**

**91. Industrial Crafts-Metal.** Principles and practices of industrial crafts that pertain to the metal area. Design and production of functional metal objects as well as fundamentals of lapidary processes will be stressed. (3W, Su) **Staff**

**92. Technical Plastics.** Use and performance requirements of plastic products. Production, techniques, optimum uses, maintenance, shapes, colors, strengths, and design. (3F) **Staff**

**93. Technical Plastics.** The techniques, rules and standards for the use of plastic materials in construction. Selection of materials, setting up production methods (dies and molds) of fabrication, surface finishing, and tooling. (3Sp) **Heggen**

**95. Graphic Arts Technology.** Fundamentals of letterpress printing, intaglio printing, lithography, screen process printing, binding and finishing operations. (3W) **Staff**

## Aeronautics Courses

**5, 5a. Composite Aircraft Structure.** Theory of flight, design, construction, repair, and maintenance of aircraft structures. Textile skins, protective finishes, primary aircraft wood structures in accordance with Federal Air Regulations. (3 and 3F) **Merrill**

**6, 6a. All-metal Aircraft Structures.** Design, construction, repair, and maintenance of all-metal aircraft, including layout, template and flat plate development, bend allowance, hand forming, riveting procedure, alignment and jiggling, power press and power shear operation, heat treatment, corrosion prevention, and pertinent Federal Air Regulations. (3 and 3W) **Merrill**

**7, 7a. Aircraft Maintenance.** The maintenance, repair, and alteration of modern aircraft including primary and secondary structures, and the various systems and appliances. Rigging, assembly, and general servicing is included. Pertinent Federal Aviation Regulations are studied. (3 and 3Sp) **Merrill**

**8, 8a. Aircraft Powerplants.** Introduction, operation, maintenance and repair of modern air cooled aircraft engines, including design, disassembly and reassembly procedures, special tools and their application to power sections, accessory sections, supercharger sections. Basic related material includes a study of specifications and tolerances, horsepower curves, BMEP, BHP, design factors, inspection methods, materials and processes, volumetric efficiency, compression ratios, oil and lubrication systems, and pertinent Civil Air Regulations. Five lectures, five labs. (4 and 4F) **Hill**

**9, 9a. Aircraft Powerplant Accessories.** Operation, repair and maintenance of modern aircraft engine accessories, including design, fuel systems, carburetion and carburetors, fuel, injection systems, magnetos, generators, and voltage control system, batteries and starters, and fuel pumps. Application and compliance with pertinent Civil Air Regulations. Basic related material includes combustion and combustible mixtures, electricity and magnetism, induction systems and superchargers, fuels and lubricants. Five lectures, five labs. (4 and 4W) **Hill**

**10, 10a. Aircraft Powerplant Maintenance.** Training in alteration, maintenance and operation of aircraft powerplants, including periodic inspections, servicing, diagnosis of engine malfunctioning, and engine installation. Theory of operation and design characteristics of controllable, constant speed, hydromatic, electric and reversible propellers. Overhaul and maintenance of propellers. Pertinent Civil Air Regulations. Five lectures, five labs. (4 and 4Sp) **Hill**

**11. Federal Air Regulations, Radio and Airway Procedures.** Rules and regulations pertaining to operation of aircraft, radio, and airway procedures. Open to all students. (2F, W, Sp) **Staff**

**12. Navigation.** A study of maps, charts and solutions to the various navigational problems, including radio and instrument navigation. Open to all students. (3W) **Merrill**

**15. Private Pilot Certificate.** Flying instruction essential to meet FAA flight proficiency and skill requirements for the private pilot certificate. Instruction is arranged for and paid by the student, with instruction offered by a University approved airport operator. Beginning students should not register for more than one credit per quarter. (F, W, Sp) **Staff**

**105. Aircraft Materials.** Analysis of materials as applied to aircraft. Emphasis on investigation and development of methods involving design criteria. (2W) **Staff**

**106. Fundamentals of Turbo-Jet Propulsion.** History, development and general principles of jet propulsion. Thrust and performance. combustion systems, metallurgy, fuels, fuel con-

trols, lubrication and ignition systems, aerodynamic problems, applications. (3F) **Summers**

**107. Flight Engineering.** Principles underlying relationships between altitude, power output, airplane performance, and the use of engine power curves, take-off and climb charts, cruising charts and flight logs. Three lectures, one lab. (4F) **Summers**

**108. Advanced Turbo-Jet Propulsion and Gas Turbines.** Extension of fundamental theory, axial and centrifugal flow compressors, gas turbines, jet propulsion, turbo-prop engines. Two lectures, one lab. (3W) **Summers**

**109. Elementary Aircraft Design.** Basic constructional concepts relating to aircraft design. (3F) **Summers**

**110. Aircraft Design and Construction.** Design and manufacture of stressed skin aircraft. Correlation of design requirements with manufacturing practice. Pertinent Aeronautics Administration Regulations covering design. Prerequisite: ITE 109. (3W) **Summers**

**111. Airline Maintenance and Fixed Base Operations.** Administrative problems of airline and airport management; unit organization; personnel problems; relationships with Civil Aeronautics Adm.; interline agreements, promotion and publicity. (3Sp) **Staff**

**112. Aeronautics Seminar.** Current topics in production methods, cost, design, supply and organization of interest to aeronautical technicians. (2F, W, Sp) **Staff**

**113. Airport Planning.** The airport and the community airway and airport traffic control. Airport types, fundamental requirements, planning and construction. Lighting, building and hangar design. Special problems and miscellaneous facilities. (3Sp) **Staff**

**114. Aircraft Electrical Systems and Equipment.** The more complex electrical systems used in larger aircraft. Prerequisite: ITE 10, 71. Three lectures, one lab. (4Sp) **Staff**

**115. Commercial Pilot Certificate.** Flight instruction to meet FAA requirements. Satisfactory completion of FAA tests required for certification. Prerequisite: Private pilot certificate; limit 10 credits. (F, W, Sp) **Staff**

**117. Aerospace Vehicle Weight Analysis.** A study of the control of weight and balance of flight vehicles in their empty and loaded weight conditions, and the relationship of the center of balance to the flight characteristics of the airfoil. (3F) **Merrill**

**118. Aircraft Hydraulics and Servos.** Basic principles related to fluid power transmission, covering a wide range of industrial and aerospace applications including servo mechanisms. Course is open to all majors in the ITE Department. (3W) **Merrill**

**119. Airworthiness Procedures.** A study of airworthiness standards in the manufacture of new aircraft and the in-service airworthiness standards prescribed by the manufacturers and the Federal Aviation Agency. (3Sp) **Merrill**

## Automotive Courses

**20. Driver Education.** How to drive an automobile correctly and safely. Traffic rules and regulations essential to sound driving; physical qualifications and tests of drivers; and actual supervised training in dual-control cars. Two lectures, lab arranged. (F, Sp, Su) **Wiley**

**21. Heavy Duty Chassis.** Steering devices, suspension systems, brakes, frames, and alignment factors on trucks and tractors. (5Sp) **Staff**

**22. Automotive Diesel Engines.** Four-stroke cycle and two-stroke cycle Diesel engines used in trucks and tractors. (4W) **Wright**

**23. Heavy-duty Drives.** Power transmission units used on trucks and tractors. (5F) **Staff**

**24. Fuel Systems.** Fuel tanks, carburetors, fuel pumps, fuel lines and manifolds. Includes discussions on superchargers, governors, and fuel injection. (5F) **Slaugh**

**25. Auto Electrics.** Ignition, batteries, generating systems, and cranking motors. (4W) **Slaugh**

**26. Motor Tune-up.** Trouble diagnosis and testing procedures. Covers horns, lighting systems, and other electrical units along with engines and carburetion units. Prerequisites: ITE 24, 25. (4Sp) **Slaugh**

**27. Steering Correction.** Brakes, steering mechanisms, suspension systems, frames, balance, and alignment. (4W) **Wiley**

**28. Automotive Engines.** Covers modern automobile engines, including cooling and lubrication. (4F) **Wiley**

**29. Driving Mechanisms.** Clutches, transmissions, U-joints, drive lines, and rear axle assemblies. (4Sp) **Wright**

**31. Automobile Chassis.** A general course on brakes and steering units. Open to any student who wishes to learn minor service procedures. (3F) **Staff**

**32. Automobile and Farm Power Plants.** Provides actual experience in many of the service operations on the engine and its accessories. Includes spark-ignition and Diesel engines. (3Sp) **Staff**

**33. Automobile and Farm Engine Electricity.** Stress service and repair procedures within the reach of the average driver. Covers battery and magneto ignition and includes the major electrical systems. (3Sp) **Staff**



**34. Auto Mechanics for the Driver.** For teachers of driver education and others interested in economical and prudent operation of the automobile. Includes: how the automobile runs, preventive maintenance, safety inspection requirements, exterior and interior finishes and their care, fuels, lubricants, tires, accessories, liability, insurance, driving economy, and care purchasing judgment. (3Sp, Su) **Staff**

**35. Fender Reconditioning.** Modern processes of straightening and priming fenders. (5F) **Willey**

**36. Body Reconditioning.** Complete body rebuilding procedures. Prerequisite: ITE 35. (5W) **Willey**

**37. Body and Fender Repair.** Covers basic fender and body repair processes for insurance adjusters and those who desire to do their own work. (3W) **Willey**

**38. Power Mechanics.** A study of the development and utilization of power sources such as natural power, external combustion converters, electrical converters, mechanical and fluid transfer devices. Designed especially for teachers of the industrial arts. Two lectures and one lab. (3F, Su) **Wright**

**39. Power Mechanics.** Covers concepts of various internal combustion engines such as their function; methods of converting energy; utilization; and power distribution, control, output, and measurement. Opportunity is provided for planning, developing, and organizing materials and projects for use in teaching power mechanics in the secondary school system. Two lectures and one lab. (3Sp, Su) **Wright**

**121. Frame, Suspension, and Steering Systems.** An advanced course in steering geometry and steering problems. Power brakes and power steering devices are included. Prerequisites: ITE 27, Math 34, 44. (3W) **Wright**

**122. Internal Combustion Engines.** Manufacturing and design characteristics of different engines. Attention is given to precision reconditioning of cylinders, crankshafts, and other engine units. Balance and force problems are included. Prerequisites: ITE 28, Math 44. (3W) **Willey**

**123. Automatic Transmissions.** Includes modern automatic transmissions and torque converters, electric clutches, and hydraulic systems. Prerequisite: ITE 29. (3F) **Wright**

**124. Fuel Injection Systems.** Various types of Diesel and gasoline injection systems are included. Modern testing equipment is used. Prerequisite: ITE 22. (3F) **Wright**

**125. Carburetion.** Combustion processes, heat cycles, and fuel characteristics are studied in connection with internal combustion engine carburetion problems. Prerequisites: ITE 24, Math 35. (3F) **Slaugh**

**126. Motors, Generators, and Magnetos.** An advanced course covering technical phases of these units. Laws of Physics are applied. Prerequisites: ITE 25 and preferably Physics 19. (3W) **Slaugh**

**127. Metal Refinishing.** Principles and practices in metal preparation and refinishing processes are discussed. Lacquer, enamel, novelty finishes, and special protective applications are included. Attention is given to paint mixing and color balance problems. Prerequisite: Physics 19 or equivalent work on light and color. (3Sp) **Willey**

**128. Engine Testing Procedures.** A study of engine testing and analysis procedures in determining the performance of the internal combustion engine. Provides actual experience in working with many of the scientific instruments used in engine testing. (3Sp) **Slaugh**

**130. Driver Education and Traffic Safety.** To acquaint prospective teachers and others with available instructional materials, techniques, procedures and problems related to a driver education course. (3F, Sp, Su) **Willey**

**131. Teaching Driver and Safety Education.** A practical application of classroom and behind-the-wheel teaching techniques in driver education. Consideration is given to nationally recognized methods of demonstration. (3F, Sp, Su) **Willey**

**132. Problems in Driver and Safety Education.** Formerly IE 114. For teachers, school administrators, and others responsible for directing or supervising safe driving programs in the school or community. The course includes traffic and liability law, insurance, stimulants and depressants, public relations, safety research, and applied psychology. (3W, Sp, Su) **Staff**

**133. Driver Training Teacher Workshop.** (2Su) **Staff**

**135. Heat Engines.** Introduction to elementary thermodynamics and basic heat power cycles. Prerequisite: Physics course covering heat (Physics series: 17, 18, 19). Three lectures, one lab. (4Sp) **Summers**

## Drafting Courses

**80. Technical Drawing.** Lettering, use of instruments, geometric construction, sketching, multiview drawings, dimensioning theory and practice, sectional views, and auxiliary views. One lecture, two labs. (3F, W) **Wallis**

**81. Technical Drawing.** Screw threads and threaded fasteners, keys, working drawings and specifications, intersections, developments, and pictorials. One lecture and two labs. (3W, Sp) **Wallis**

**82. Technical Drawing.** View relationship, spatial visualization, and problems relating to points, lines, and planes. One lecture, two labs. (3Sp) **Wallis**

**83. Industrial Design.** Principles involved in industrial design. Analysis, creation, and development of functional design in terms of tools, processes, forms, and materials of industry. (3F, Sp) **Wallis**

**89. Aircraft Drawing.** Aircraft drafting techniques, numbering systems, change methods, and technical specifications. Prerequisite: ITE 82. (3F) **Staff**

**182. Architectural Drafting and Specifications.** Fundamentals of architectural drafting; plans, details, conventions, specifications; units of structure and their representation. Prerequisite: ITE 82. (3F) **Staff**

**183. Machine Drafting.** Drafting techniques, symbols, conventions used in the representation of gears, cams, jigs, and fixtures. Prerequisite: ITE 82. (3W) **Staff**

**184. Technical Illustration.** Methods of converting orthographic drawings into three-dimensional drawings. Shading, inking, and air-brush techniques are introduced. Prerequisite: ITE 82. (3Sp) **Staff**

**185. Production Drawings.** Advanced techniques of production drawings; detail, assembly production dimensions, tolerances, position tolerances, classes of fits, surface quality, and specifications. Prerequisite: ITE 82. (3Sp, Su) **Staff**

## Electricity-Electronics Courses

**71. Direct Current Electricity.** Fundamentals of direct current electricity. Includes a study of the basic concepts, circuits, laws, measurements, and electrical energy sources as they relate to DC electricity. Practical applications are given in laboratory exercises. Prerequisite: Math 34 or equivalent. (3F, W, Sp) **France**

**72. Alternating Current Electricity.** Fundamentals of alternating current electricity. Includes a study of the basic concepts, circuits, laws, measurements and electrical energy sources as they relate to AC electricity. Practical applications are given in laboratory exercises. Prerequisite: ITE 71, Math 44. (3W) **France**

**73. Vacuum Tubes and Semiconductors.** Fundamentals of vacuum tubes and semiconductors. Includes a study of the basic concepts, characteristics, parameters, specifications and applications of vacuum tubes and semiconductors. Practical analysis is accomplished through laboratory exercises. Prerequisite: ITE 72. (3Sp) **France**

**79. Practical Electric Wiring.** Includes a study of basic circuits, materials, inspection procedures, electrical codes and practices related to the installation of electrical wiring in the home and small public buildings. Practical application will be centered around the actual wiring of a mock-up home. Two lectures, one lab. (3W) **France**

**173. Basic Electronic Circuits.** An introduction to and analysis of the basic electronic circuits commonly found in a wide variety of electronic devices. The concepts of power supplies, oscillators, amplifiers, and other basic circuits will be studied as they may relate to such devices. Practical analysis is accomplished through laboratory exercises. Prerequisite: ITE 73. (3W) **France**

**174. Electronic Circuits and Systems for Radio.** A study of the fundamentals of radio communication and of the concepts of electronic circuits and systems employed in the modern radio receiver. Practical application will be centered around the construction, and testing of a radio receiver. The principles of radio transmission and transmitters will also be introduced. Prerequisite: ITE 73. (3W) **France**

**175. Industrial Electronics.** An introduction to and study of the concepts of electronic devices and circuits used in industrial applications for measurement and control purposes. Practical application will be accomplished through laboratory exercises. Prerequisite: ITE 73. (3Sp) **France**

## Metals Courses

**50. General Metals.** Development of the skills of general metalworking and foundry. Experience in bench metal, sheet metal, tenance, shop safety and industrial practices of metal fabrication. (3F, W) **Palmer**

**51. Machine Shop Operations.** A fundamental course covering the design, function, care, setup and operation of the basic machine shop equipment. Emphasis on the theory and skill in layout, drilling, tapping, turning, threading, shaping, tool grinding, and precision measuring. (3W, Sp) **Palmer**

**52. Jig and Fixture Construction.** Presents the principles and processes involved in the designing and building of tooling for various welding processes. Laboratory work involves the designing and building of tools with emphasis on jigs and fixtures for welding. Prerequisites: ITE 44, 51, and 82. (3W) **Staff**

**150. Machine Tool Maintenance.** Construction, operating principles and maintenance problems of machines used in the school shop. Grinding the various machine cutting tools, repair and development of various tools and equipment that are used in the school shops. Prerequisite: ITE 51. (3F) **Palmer**

**151. Foundry Principles and Practices.** Principles and practices of basic foundry work. Castings are made using common non-ferrous metals, such as aluminum, copper, brass, and bronze. Two three-hour labs. (2F) **Palmer**

**152. Machine Tool Operations.** Practice in the operations on engine lathe, milling machine, contour band saw and shaper. Emphasis is placed on design of cutters, feeds, and speeds, and holding devices as used in school shops. Prerequisite: ITE 51. (3Sp) **Palmer**

**153. Industrial Machine Tool Operations.** Theory and practice involving industrial equipment, layout, machine set-up, indexing, gear cutting, surface grinding, tool grinding, cutting fluids, wear rates and precision measurement. Prerequisite: ITE 51. (3W) **Palmer**

## Welding Courses

**40. Fundamentals of Welding.** A basic service course designed to acquaint the student with the more common welding processes. Units include oxyacetylene welding, brazing and cutting; electric arc welding and resistance spot welding. (3F, Sp) **Staff**

**41. Oxyacetylene Welding.** Presents the principles and practices of oxyacetylene welding, cutting and brazing. (3W) **Staff**

**44. Electric Arc Welding.** Basic course presenting the principles and practices of electric arc welding. Emphasizes safety and process methods used in the welding of mild steel in the flat position. **Staff**

**45. Electric Arc Welding.** Presents the principles and practices of electric arc welding to code specifications. Prerequisite: ITE 44. (3Sp) **Staff**

**47. Acetylene Welding.** Principles and practices in fundamentals of oxyacetylene welding and cutting. A general service course open to all university students. Two lectures, two two-hour labs. (3F, W, Sp) **Staff**

**48. Aero Welding.** A basic course providing an introduction to the fundamental principles of oxyacetylene welding and cutting as it applies to aircraft production and repair as set forth by Civil Air Regulations. Two lectures, two two-hour labs. (3W) **Staff**

**49. Electric Arc Welding.** The basic course providing for principles and practices in the latest types of electric arc welding equipment. Emphasizes safety measures and methods used in the welding of mild steel in the flat position. A general service course open to all university students. (3F, W, Sp) **Staff**

**141. Welding Design.** Presents the principles and processes involved in the design of welded structures. Laboratory work involves the making of welded structures, designs, and fabrication of same. (3F) **Long**

**141-A. Welding Estimating.** Presents the principles and procedures involved in the planning of a manufacturing sequence and estimating of the costs for welded items. Studies will be based on analysis of product design to determine procedures and work elements. Standard data and time studies will be used to measure the work elements. Laboratory work involves the planning and estimating of welded designs. Prerequisites: Mfg. Engineering 137 and ITE 141. (3F) **Long**

**142. Welding Design and Inspection Methods.** Presents a detailed study of inspection methods and quality assurance systems and their techniques as applied to welding. Laboratory work shall include statistical, destructive, and non-destructive systems and their application to welding as a means of predicting quality. (3W) **Long**

**143. Advanced Welding Processes.** Presents a detailed study of those processes using the phenomena of welding, but not commonly recognized as such: stud welding, surfacing, flame spraying and plasma. Prerequisites: ITE 41 and 44. (3Sp) **Long**

**144. Welding Metallurgy—Ferrous.** A detailed analysis of different heat effects and treatments of ferrous metals. Laboratory exercises include polishing and etching of metal specimens and microscopic study of their internal structures. Prerequisite: A basic welding course. (3F) **Staff**

**144-A. Welding Metallurgy—Non-Ferrous.** A detailed analysis of different heat effects and treatments of non-ferrous metals. Laboratory exercises include the polishing and etching of metal specimens and microscopic study of their internal structures. Prerequisite: ITE 144. (3W) **Staff**

**145. Resistance Welding.** Presents the principles and practices involved in the set-up and operation of resistance welding equipment. Emphasis will be developing resistance welding parameters and laboratory evaluation of welds. (3Sp) **Long**

**146. Weldability of Metals.** Presents a detailed study of the weldability of various metals in terms of the metallurgy involved. Laboratory work consists of the establishment of welding parameters including filler metals and pre-weld cleaning. Prerequisites: ITE 144 and 144-A. (3F) **Long**

**146-A. Weldability of Non-Ferrous Metals.** Designed for detailed study of the weldability of non-ferrous metals in terms of the metallurgy involved. Laboratory work consists of making sample welds and the inspection and testing of these welds by various methods. Prerequisite: ITE 144-A. (3Sp) **Staff**

**147. Advanced Electric Arc Welding.** Presents detailed technical information on advanced welding processes and opportunity for advanced skill development. Consideration is given to basic welding metallurgy and the weldability of metals. Prerequisite: ITE 40 or 44. (3F) **Staff**

**148. Applied Welding Technology.** Presents a synopsis of welding technology. Laboratory work consists of the application of welding technology by designing, estimating, processing, tooling, fabricating, and inspecting a welded product. Prerequisites: ITE 45, 141-A and 146. (3Sp) **Long**

**149. Heat Treating of Ferrous and Non-Ferrous Metals.** Designed to provide training and some research work in the field of heat treatment of ferrous and non-ferrous metals. Laboratory work includes exercises in the various methods of heat treating ferrous and non-ferrous metals. Prerequisite: ITE: 144-A. (3Sp) **Staff**

**149-A. Heat Treating of Ferrous and Non-Ferrous Metals—Equipment.** Presents a detailed study of the equipment currently used in industry to perform the various heat treating operations with particular emphasis upon those related to welding. Laboratory exercises shall include annealing, stress relieving, tempering, hardening and furnace brazing. Parameters for the application of those processes shall be developed. Prerequisite: 149. (3Sp) **Long**

## Woods Courses

**61. Technical Woods.** Study of the types of woods, finishes, abrasives and adhesives of the woods industry and practice in the fundamental handtool processes. (3F) **Mannion**

**62. Technical Woods.** Practice in the operation of basic machine woodworking equipment with study of their uses and nomenclature. (3W) **Mannion**

**63. Technical Woods.** Continued practice in woodworking machinery and on attachments with emphasis on design and construction of articles made of wood. (3Sp) **Mannion**

**64. Upholstering.** Modern automobile and furniture upholstery processes. Students upholster their own units as they learn. (3W) **Staff**

**69. Woodwork for Everyone.** Open to all, both men and women, who have a desire to work with wood. Instruction is given in the fundamentals of woodworking and includes training in the use of both hand tools and woodworking machines. Projects are selected and built by students; a wide latitude in the selection of projects is afforded. Instruction is given in furniture repair and in the basic principles of wood finishing and refinishing. (2-5F, W, Sp) **Staff**

**160. Cabinet Making and Furniture Construction.** Advanced cabinet and furniture making including construction design and opportunity for application of original designs. Practical work is provided in the construction of fine furniture and built-in cabinet work. Prerequisite: ITE 63. (3F) **Slack**

**162. Industrial Woods.** In this course, considerable time is spent in the development, construction and uses of woodworking projects designed for high school teaching purposes. The development of jigs and fixtures for use in mass production techniques in high school shops is introduced through practice in production line runs. Prerequisite: ITE 63. (3W) **Slack**

**163. Dwelling Construction and Estimating.** A study of the principles of carpentry and construction as they apply to dwellings. The building codes, specifications and regulations for construction are applied to the making of a scale model structural home. Layout, strength of materials and procedure emphasized. Prerequisite: ITE 63. (3Sp) **Slack**

**164. Wood Finishing.** Study and practice in the kinds of opaque and transparent finishes for woods as applied by brush, spray or wipe on methods. Attention is given to the types of finishes, stains and methods of polishing as well as application. Prerequisite: ITE 61. (3W) **Staff**

**168. Industrial Arts for Elementary Schools.** Objectives and theory of Industrial Arts in the elementary school. Suitable instructional content will be presented for each grade level, and methods of teaching and organizing instructional materials will be carefully considered. Instruction is given on the use of tools and materials in the shop where projects suitable for the elementary school will be constructed from modern industrial materials. Two lectures, one lab. (3W) **Mannion**

**169. General Shop Laboratory.** Comprehensive laboratory course covering the manipulation areas of the General Shop. Emphasis will be given in all areas of metal work, woodwork, and crafts. Designed especially for teachers needing special work in one or more areas. (3Su) **Staff**

## Professional Courses

**100. 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. (3Sp) **Staff**

**101. Observation in Student Teaching.** Serves as a preliminary to the regular student teaching in Industrial Education. Students are assigned to various schools within the area to observe teaching in Industrial Education. (1W) **Staff**

**102. Instructional Aids.** Instruction in the purpose, types, sources, preparation and proper use of instructional aids, including samples, models, charts, graphs, slides, still film, movie film, sound film graphics and other aids suitable for classroom and laboratory use. (3F) **Staff**

**103. General Shop.** Comprehensive study of the types of "General Shop," its advantages and limitations; content and organization of subject matter; method of teaching and shop plans. General shop projects, shop plans and new trends in content and equipment are given special consideration. (3Su) **Staff**

**104. Occupational Analysis.** Principles and practice in analyzing occupations. Students complete an analysis of one unit for a trade or occupation. (3F, W, Su) **Staff**

**190. Special Industrial Education Workshop.** Allows for conducting special workshops, as needed, especially for the in-service training of Industrial Education teachers, supervisors, and administrators. May be repeated as needed providing the workshops are different, but if the credit is to be used toward a Baccalaureate or Master's degree, limitations shall be placed by the department or a student's Graduate Committee. Credit arranged. (F, W, Sp, Su) **Staff**

**191. Industrial Safety Education.** The psychology and philosophy of accident causation and prevention in school, home, community, and industry. Stresses the various aspects of safety in many areas and includes organization. Students observe and teach in Industrial education programs. (3W, Sp, Su) **Staff**

**192. Personnel Relations.** Training for leadership in industry as foremen, supervisors, and directors. Problems in organizing, supervising, training, and directing personnel. Directed conferences based on student experiences and directed studies in leadership problems and principles. (3F, Sp) **Staff**

**193. Shop Organization and Management.** Teaches students to organize and manage an Industrial Education Shop of the unit, general, or multiple activity type. Students prepare for one type of shop, a complete plan of organization and management dealing with the necessary equipment, materials, supplies, methods of purchasing, financial control, and problems of shop arrangement. (3W, Su) **Staff**

**194. Student Teaching in Industrial Education.** Students observe and teach in Industrial Education programs throughout the state, practice teaching in various Industrial Education courses in junior, senior, or post high schools. (9W) **Staff**

**195. Methods in Industrial Education.** Latest techniques of teaching applied to individual and group instruction in Industrial Education. Students have opportunity to use these different methods in presenting lessons before the class. (3W) **Staff**

**196. Organization and Development of Instruction Materials.** Selection and arrangement of teaching materials to be used in Industrial Education course work. (3Sp) **Staff**

**197. Honors Studies.** Advanced work for qualified students. Work is initiated by a 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 credits arranged. (F, W, Sp) **Staff**

**198. Special Problems in Industrial Education.** For qualified students majoring in Industrial Education who wish to do specialized work not covered by other courses. Credit arranged. (F, W, Sp, Su) **Staff**

**199. Related Technical Training in Vocational Education.** A course provided for students enrolling in industry and factory schools conducted on the university level, wherein instructors, course content, and facilities have been approved by a committee functioning through the Industrial and Technical Education Department. This course may be repeated for a maximum of nine credits to be acquired at a rate not to exceed one and a half credits per 40 clock-hour week. Students should not expect to acquire more than three credits in this course in any one calendar year except where teacher training courses are of longer duration. Regular university fees must be paid and registration procedures followed. Credit arranged. **Staff**

## Graduate Courses

**200. Industrial Education Experimental Lab.** Designed to give selected Senior students and graduate students in Industrial Education opportunity for experimental work with new tools, equipment, materials and processes for improved program development and teaching techniques. May be repeated up to a total of six credits. Credit arranged. (F, W, Sp, Su) **Staff**

**205. Trade, Industrial, and Technical Workshop.** Provides opportunity for professional improvement and upgrading of trade, industrial, and technical teachers. Dissemination of current technical and professional material that the instructors must be aware of to maintain their position in the teaching of industrial subjects. Credit arranged. **Staff**

**206. Vocational and Technical Administration Workshop.** Provides opportunity for professional improvement of administrators and supervisors of vocational and technical programs. Credit arranged. (Su) **Staff**



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**207. Philosophy of Vocational Education and the Practical Arts.** Designed to enrich and expand understanding of the nature and purposes of vocational education and practical arts, their relationships and differences, and the place each phase of the work should have in a public school program. (3F, Su) **Mortimer**

**209. Curriculum Development in Industrial Education.** The significance, importance, and use of the course of study in industrial education. Actual construction of a comprehensive course of study for one of the phases of industrial education. Prerequisite: ITE 104. Three lectures. (3W, Su) **Loveless**

**210. Trends in Industrial Education.** A preview of industrial education tomorrow; what industrial education will do. The evaluation of educational and industrial thought; the source of materials to meet present-day trends. (3Su) **Staff**

**224. History of Industrial Education.** Historical developments of manual and industrial education from the early leaders to the present. Emphasis is given to the influence that various leaders and movements in both Europe and America have had upon present-day objectives of industrial arts and vocational industrial education. (3W, Su) **Slack**

**232. Aerospace Education.** An introduction to aerospace for teachers in elementary and secondary schools, to include such content areas as: 1) a study of the principles of flight, 2) knowledge of the earth's atmosphere, 3) the control of aircraft in flight, 4) information on the federal airways and airports, 5) the principles of jet propulsion, and 6) an opportunity to take an orientation flight, and also receive some basic instruction in handling an aircraft in flight. Nationally known speakers will be used as resource specialists throughout the course. (3Su) **Staff**

**240. Cooperative Industrial Programs.** For potential coordinators of parttime cooperative industrial and technical classes. Essential information for conducting federally and non-federally reimbursed work experience industrial classes in secondary and post high schools. (3Su) **Staff**

**245. Organization of Industrial Education Programs.** The laws, regulations, and policies affecting industrial and technical education programs; organization of industrial and technical programs at the secondary and post high vocational and technical institute level; local, state, and federal relationships. (3Sp, Su) **Staff**

**251. Administration and Supervision of Industrial Education.** Administration, supervision and management necessary for successful operation of Industrial Education programs. (3Sp, Su) **Staff**

**254. Measurement in Industrial Education.** Construction and use of the various types of tests and rating scales used in Industrial Education. Emphasizes measurable factors in industrial education and the types of tests best suited to this field. The elements of statistical methods necessary for intelligent use of the tests. Prerequisite: Psychology 112. (3Sp, Su) **Mortimer**

**261. Problems of Adult Education.** Development of Adult Education movements; learning abilities, educational interests, needs of adults, organization of evening school programs, apprenticeship training, and related instruction for trade programs. (3Sp, Su) **Slack**

**267. Reading and Conference.** Provides for study in advanced and specialized problems in Industrial Education. Problems are selected with approval of department adviser; investigation is carried on under direction of the major professor. Credit arranged. (F, W, Sp, Su) **Staff**

**270. Seminar in Industrial Education.** Gives opportunity for investigation and reporting of individual problems. (1-2Sp, Su) **Staff**

**271. Research and Thesis Writing.** Provides for individual work in thesis writing in industrial education. Credit arranged. (F, W, Sp, Su) **Staff**

**275. Research in Industrial and Technical Education.** To provide teachers, supervisors and directors of industrial and technical programs with research methods and techniques which are applicable to their programs. Includes interpretation of various kinds of research. The conducting of a research project is part of the class activity. (3F, Su) **Loveless**

**355. Internship in Industrial and Technical Programs.** Designed for the advanced student working toward the Doctor of Education degree in Industrial Education. Student works under the direct guidance of an administrator or supervisor of Industrial and Technical programs in the public schools. Credit arranged. (F, W, Sp, Su) **Staff**

**365. Advanced Independent Study in Industrial Education.** Provides opportunity for advanced student to do independent study in the field of Industrial and Technical education. Credit arranged. (F, W, Sp, Su) **Staff**

**371. Research for the Doctorate Thesis in Industrial Education.** Credit arranged. (F, W, Sp, Su) **Staff**

Department of

# Manufacturing Engineering

**Head:** Associate Professor Carl D. Spear  
Office in Technical Service Building

**Professors** Bruce O. Watkins, Reynold K. Watkins; **Associate Professors** Rawson D. Child, G. Merrill Shaw, Owen K. Shupe, W. Karl Somers.

**Degrees:** Bachelor of Science (BS), Master of Science (MS).

**Major:** Manufacturing Engineering.

Manufacturing Engineering is a branch of engineering in industry whose function is to plan the processes of economic manufacture, to specify or design the manufacturing tools and equipment, and to integrate the facilities required for producing given products with minimal expenditure of time, labor, and materials. Some typical responsibilities of manufacturing engineers are: to develop the manufacturing plan for each product so that it can be made with a minimum of time, labor, and materials; to interpret product designs to the shop, and inform product designers of shop limitations and capabilities; to coordinate manufacturing projects so that products are delivered on schedule and within costs; to exploit new processes, materials and methods that lead to lower costs and a better product; to provide and allocate facilities so that the company maintains a competitive advantage.

Manufacturing engineers act as catalysts in today's industry, translating the exacting concepts of the product designer into reality. With the rapid development of new technology, the education of the manufacturing engineer takes on new importance.

National surveys indicate that increasing numbers of manufacturing engineers are needed. As industrial production expands in Utah

and across the nation, opportunities will continue to increase.

The Manufacturing Engineering Laboratories, the Metallurgy, Inspection and Senior Students' Design room are all equipped with modern facilities for teaching, for engineering experimentation and for student development in Manufacturing Engineering.

The department coordinates a program of summer employment for Junior students. This industrial experience greatly benefits the student in his understanding and application of the engineering concepts studied in classes. Field trips to industrial plants are conducted each year for Junior and Senior students.

The department is closely affiliated with the American Society of Tool and Manufacturing Engineers. There is an active student Chapter of the Society on campus which promotes the professional and social interest of the Manufacturing Engineering students.

## Undergraduate Study

The following curriculum leading to the Bachelor of Science degree in Manufacturing Engineering resulted in Utah State University receiving the American Society of Tool and Manufacturing Engineers 1965 National Education Award. This award connotes recognition

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and acceptance of the curriculum by the National Society.

### Lower Division

Freshman and Sophomore courses follow the common engineering curriculum listed in the College of Engineering introduction.

### Upper Division

#### JUNIOR YEAR

Course	Credits		
	F	W	Sp
Mfg Engin 151, 152, 153 .....	3	3	3
Mfg Engin 148, 140 .....	3		3
Mfg Engin 157, 181 .....		3	5
Mfg Engin 160, 161, 162 .....	2	2	2
Civil Engin 103 .....		5	
Elec Engin 105, 124 .....	3	3	
English 113 .....		3	
<sup>1</sup> Humanities .....		3	4
<b>Total</b> .....	<b>16</b>	<b>17</b>	<b>17</b>

#### SENIOR YEAR

Course	Credits		
	F	W	Sp
Mfg Engin 158, 182 .....	3	5	
Mfg Engin 187, 188, 184 .....	1	1	1
Mfg Engin 180, 183 .....		3	3
Mech Engin 130 .....	4		
Mfg Engin 141, 142 .....	3	3	
Civil Engin 140 .....	3		
Mfg Engin 144, 134 .....		3	4
Mech Engin 111 .....		3	
Humanities .....	3		6
<b>Totals</b> .....	<b>17</b>	<b>18</b>	<b>14</b>

### Graduate Study

The graduate program in Manufacturing Engineering provides course work leading to the Master of Science degree. To meet individual interests, the graduate student may select one of three options to be taken along with the Manufacturing Engineering core. These options are: Engineering Administration, Manufacturing Systems Design, Applied Statistics and Computer Science. General requirements for the Master's degree are:

1) To be accepted as a candidate an applicant must: a) hold a

<sup>1</sup>See College of Engineering section for Humanities requirements.

Bachelor of Science degree from an institution of recognized standing in one of the fields of Engineering or Physical Science, b) have had adequate preparation for graduate study in the chosen field of specialization, and c) show promise of doing well in advanced study as judged by previous scholastic record and other achievements.

2) The Master of Science curriculum must include at least 45 credits numbered 100 or above, with at least 10 credits in courses numbered 200 or above. A total of 9 credits of acceptable graduate work may be transferred from another approved graduate school. A maximum of 18 credits may be taken at off-campus residence centers maintained by Utah State University. A minimum of 15 credits, exclusive of thesis, must be completed on the Logan campus. Additional requirements, such as qualifying examination, final examination, time limit, etc., as outlined by the School of Graduate Studies, are included.

3) Selection of specific courses in the curriculum will be under advisement of a supervisory committee which is appointed by the Dean of the Graduate School.

The candidate's program will include a selection of courses in the following areas:

	Credits
Mfg Engin Core .....	21
Thesis .....	9
Minor—(option in Engineering Administration, Manufacturing Systems Design, or Applied Statistics and Computer Science) Minimum .....	15
<b>Total</b> .....	<b>45</b>

An integrated program may be selected from the following courses:

#### Manufacturing Engineering Core:

	Credits
Applied Statistics (Ap St 131, 132, 176) .....	11
Computer Science (CS 167) .....	3
Value Engineering (Mfg E 258) .....	3
Metal Machining (Mfg E 251) .....	5
Methods Engineering (Mfg E 230) .....	3
Material Handling (Mfg E 283) .....	3

Manufacturing Seminar (Mfg E 287) .....	2
Special Problems (Mfg E 273) .....	3
Automation Systems (Mfg E 290) .....	3
Thesis (Mfg E 298) .....	9

**Engineering Administration:**

	<b>Credits</b>
Production Management (BA 136) .....	5
Accounting for Mgt Control (Acct 209, 210) .....	6
Elem of Micro Econ Theory (Econ 100) .....	3
Managerial Economics (BA 250) .....	3
Administrative Control (BA 212) .....	3

**Manufacturing Systems Designs:**

	<b>Credits</b>
Machine Frame Analysis (ME 106) .....	3
Mechanical Analysis (ME 131) .....	4
Mechanical Design (ME 132) .....	4
Mechanical Design Projects (ME 133) ....	4
Dynamics of Machinery (ME 135) .....	4
Feedback Control (EE 160) .....	4
Advanced Mechanics of Materials (ME 165) .....	4
Dimensional Analysis and Similitude (CE 260) .....	4

**Applied Statistics and Computer Science:**

	<b>Credits</b>
Computer Programming (CS 145, 146) ....	3
Design of Experiments (Ap St 134) .....	4
Industrial Statistics (Ap St 221) .....	3
Operations Research (CS 245, 246) .....	6

## Manufacturing Engineering Courses

**52, 53. Production Processes.** Lathe, shaper, milling, and grinding operations. Two lectures, one lab. (3 taught on demand) **Staff**

**56. Machine Lab for Engineers.** Acquaints the student with basic machine tool operations. Two lectures, one lab. (3F, W, Sp) **Staff**

**57. Linear Metrology.** A review of dimensional metrology in theory and practice. Factors of linear measurements affecting reliability and control in quality. Prerequisite: Math 44. (3F taught on demand) **Shaw**

**134. Fundamentals of Machine Design.** Application of principles of mechanics, strength of materials and kinematics to the design of basic machine elements. Force and stress analysis. Introduction to general design of major machine members; fastenings, power transmitting devices, shafts, bearings, gearing. Prerequisites: ME 130 and CE 103. Three lectures, one lab. (4Sp) **Watkins**

**137. Work Simplification and Layout.** A study of management techniques with emphasis on methods improvement, time study analysis, plant layout and material handling procedures, particularly adapted to Business Administration majors. (4W) **Staff**

**140. Material Science.** An introductory course dealing with the structure of material substances and the relations between structures and the engineering properties of materials. Topics covered will include crystal structures of metals, alloys, and ceramic phases; structures of non-crystalline solids such as glasses and cements; imperfections in crystals; phase diagrams. Prerequisites: Physics 22, Chem 10, 11. Three lectures. (3Sp) **Shupe**

**141. Physical Metallurgy.** A study of the theory, structure, and properties of metals and alloys with examples of their relation to manufacturing practices. Prerequisite: Mfg E 140. Two lectures and one three hour lab a week. (3F) **Spear**

**142. Ceramic and Plastic Materials.** The study of ceramic and plastic structures with special emphasis on crystal structures and interatomic bonding. Separate attention will be given to mechanical, thermal, electrical, and magnetic properties of these materials. (3W) **Spear**

**144. Applied Hydraulics and Pneumatics.** Theory and practice in hydraulics and pneumatics as they apply to machine tools and controls. Prerequisite: CE 140. Two lectures, one lab. (3W) **Staff**

**148. Manufacturing Processes.** Fundamentals of manufacturing processes; shows possibilities and limitation of these processes and their application to fabrication of industrial products. (3F, Sp) **Child**

**150. Engineering Metallurgy.** A study of the physical properties, composition, constituents, and heat treatment of metals and metal alloys. Material specifications, tests, and places of applications in industry are reviewed. Prerequisite: Chem 10. Three lectures, one lab. (4F) **Shupe**

**151. Manufacturing Operations—Fundamentals.** The study and analysis of metal machining theory as applied to basic production machines. Emphasis is placed on understanding the capability and versatile usefulness of the machines. (3F) **Somers**

**152. Manufacturing Operations — Planning.** The analysis of product design, economical production planning, and a study of machinability factors. Prerequisite: Mfg E 151. (3W) **Shaw**

**153. Advanced Manufacturing Systems.** The utilization of standard production equipment, including numerical controlled machines, automatic production machines and specialized equipment. Prerequisite: Mfg E 152 (3Sp) **Child**

**157. Quality Control.** A study of quality control systems in manufacturing; dimensional, non-destructive, and statistical systems are emphasized. Prerequisite: ME 120. (3W) **Staff**

**158. Manufacturing Economy.** Economics of tooling operations: the productivity of machines, tool maintenance, tool costs, and job estimating. Prerequisites: Mfg E 148. (3F)

Shaw

**161, 162, 163. Manufacturing Processes Laboratory.** The analysis and application of production equipment utilized in the machining, shape changing, joining, and surface finishing of industrial materials. (2F, W, Sp) Staff

**173. Formulation and Solution of Problems Related to Manufacturing Engineering.** Comprehensive report required. Prerequisite: Senior classification and permission of the department head. (3F, W, Sp) Staff

**180. Motion and Time Study.** An analysis of motion and time study as applied to manufacturing procedures, with emphasis given on work simplification, motion economy, time standards, and performance ratings. (3W, Sp) Child

**181. Tool Design.** The study and design of production tools such as gages, jigs, and fixtures. Includes tool design standards, tolerance, springs, cam layout, and techniques of preparing tooling for production. Three lectures, two labs. Prerequisites: Mfg E 152, CE 103. (5Sp) Somers

**182. Die Design.** Emphasizes design and application of tooling to materials and products fabricated by press working production methods. Prerequisite: Mfg E 181. Three lectures, two labs. (5W) Somers

**183. Plant Layout.** A study of the utilization of space, machines, materials handling methods and equipment for economical production. Laboratory consists of organization and planning details for layout of production facilities. Prerequisites: Mfg E 148, 180. Two lectures, one lab. (3Sp) Shaw

**184. Manufacturing Engineering Seminar.** A review of current technical literature dealing with the latest production methods. Oral and written reports presented for discussion. (1Sp) Staff

**187, 188. Senior Project.** Each student is assigned a manufacturing problem involving design, development, construction, and testing. A formal technical report is required of each student. (1F, arr W) Staff

**197. Honors Studies.** Advanced work for qualified students. Work is initiated by a 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 credits arranged. (F, W, Sp) Staff

**240. Advanced Material Science.** Theoretical aspects of materials; structure of crystalline and non-crystalline materials; phase equilibria; surfaces and interfaces; imperfection and flow of matter. A quantitative treatment of material properties. Prerequisite: Consent of instructor. Three lectures. (3Sp) Spear

**251. Metal Machining.** Accelerated study of metal machining concepts including basic machine tool operations, cutting tool geometry, cutting metallurgy and machinability, machining economics, process capability studies for dimensional conformance, mechanics of chip formation, cutting dynamometry, and grinding principles. Prerequisite: graduate student in Engineering. Three lectures, two labs. (5F) Somers

**258. Value Engineering.** Principles and techniques of value analysis and engineering as applied to all phases of manufacturing. Organization requirements for an effective value system. Effective techniques for completing engineering staff work. Prerequisite: Mfg E 158. Three lectures. (3F) Shaw

**273. Special Problems in Manufacturing Engineering.** Independent or group study of engineering problems not covered in regular course offerings. (Time and credit arranged) Staff

**274. Special Studies in Manufacturing Engineering.** Special registration for students who have obtained the maximum number of credits for the thesis or Plan B Report and who have not yet completed the writing of the thesis or Plan B Report and who are not registered for other courses. (Time and credit arranged) Staff

**280. Methods Engineering.** Work measurement methods; the application of work simplification methods in industrial organizations. Prerequisite: Mfg E 180. Two lectures, one lab. (3W) Child

**283. Material Handling.** Analysis of material handling problems, selection of material handling equipment, and problems in the design of integrated handling systems. Prerequisite: Mfg E 183 or consent of instructor. (3Sp) Shaw

**287. Manufacturing Seminar.** Students prepare technical papers on suitable topics and present to Mfg E staff and graduate students. Two lectures. (1F, W, Sp) Spear

**290. Automation Systems.** Design of automated production systems; special emphasis on electronic, hydraulic and pneumatic controls as applied to numerically controlled and other automated production equipment. Prerequisites: EE 124, CE 144, Mfg E 181. Three lectures. (3Sp) Staff

**298. Graduate Thesis.** Credit arranged. (F, W, Sp, Su) Staff



Department of

# Mechanical Engineering

(Mechanical and Aerospace Engineering,  
Chemical Engineering)

**Head:** Professor Reynold K. Watkins  
Office in Engineering L-180

**Associate Professors** Izydor Eisenstein, Russell M. Holdredge, A. R. McKay, Owen K. Shupe, Carl D. Spear, Edward W. Vendell; **Assistant Professors** J. Clair Batty,<sup>1</sup> Robert D. Harris, Alma P. Moser, Ross A. Nyman, Albert B. Smith, Dan H. Swenson; **Instructor** Val E. Simmons.  
**Degrees:** Bachelor of Science (BS), Master of Science (MS), Doctor of Philosophy (PhD).

**Major:** Mechanical Engineering.

Mechanical Engineering is the development of energy and its utilization in machines and systems that serve mankind. A machine may be anything from a crowbar to an aero-spaceplane. Engineering firms, industries, utilities, many government agencies, and research foundations require mechanical engineers who specialize in areas such as: Aeronautics, Automotive Engineering, Nuclear Engineering, Petroleum Engineering, Industrial Engineering, Space Engineering, Thermodynamics, Heat Transfer, Machine Design, Power Production, Systems Engineering, Management, Equipment Sales, Refrigeration, and Air Conditioning.

Limited specialization in these areas can be achieved in the undergraduate technical elective program in the Senior year, but most firms prefer that additional specialization be obtained in industry or on a graduate level. Consequently, undergraduate emphasis is placed on basic engineering fundamentals such as mathematics, chemistry, physics, and basic engineering sciences. Upon graduation the student is qualified to become an engineer-in-training in industry or

to continue specialization in graduate study.

Up-to-date laboratory facilities, including a subcritical nuclear reactor and wind tunnel are available.

## Undergraduate Study Lower Division

The following curriculum leading to the Bachelor of Science degree in Mechanical and Aerospace Engineering is accredited by Engineers' Council for Professional Development. Freshman and Sophomore common Engineering curriculum are listed under "College of Engineering."

## Upper Division

Course	JUNIOR YEAR			Credits		
	F	W	Sp	F	W	Sp
ME 111, 112, 113 .....	3	3	3			
CE 103 .....	5					
EE 105 .....					3	
CE 140, 141 .....	3	3				
ME 116, 117 .....		3	3			
ME 130 .....			3			
ME 160 .....	3					
ME 161 .....		3				
Mfg E 148 .....	3					
<sup>1</sup> Group Requirements .....		4	4			
Total .....	17	16	16			

<sup>1</sup>See College of Engineering for details of group requirements.

<sup>1</sup>On leave.

Course	SENIOR YEAR	Credits		
		F	W	Sp
ME 131, 132, 133 .....		4	4	4
ME 119, EE 124 .....		3	3	
ME 198 .....		1	1	1
ME 150, 151 .....			3	3
<sup>2</sup> Approved Electives .....		6	3	6
<sup>1</sup> Group Requirements .....		3	3	3
<b>Total</b> .....		17	17	17

## Chemical Engineering Curriculum

A two-year pre-Chemical Engineering curriculum is offered with the same required courses as the two-year core curriculum in Engineering except for the substitution of Chemistry 22 and Economics 51.

## Graduate Study

The department offers a graduate program leading to the MS and PhD degrees in Mechanical and Aerospace Engineering. The program is designed for specialization in applied mechanics, materials, fluid mechanics, nuclear engineering, and propulsion and energy conversion, thermodynamics and heat transfer.

Forty-five credits beyond the Bachelor's degree are required for the Master of Science degree in Mechanical Engineering. Nine credits of mathematics are required beyond that required for a BS degree.

Following is a typical course of study leading to the degree of Master of Science in Mechanical and Aerospace Engineering.

Course	Credits			
	F	W	Sp	Su
Math 140, 141, 142 .....	3	3	3	
ME 205 .....		3		
ME 240 .....	3			
ME 210, 211 .....	3	3		

<sup>1</sup>See College of Engineering for details of group requirements.

<sup>2</sup>Approved electives may be selected from the following courses after consultation with adviser: ME 135, 143, 162, 165, 166, 183, 187, 190-195; Physics 122; Math 140, 141, 142; and others.

Specialization .....	3	3	9	
ME 298 .....				9
<b>Total</b> .....	12	12	12	9

The PhD degree is offered in nuclear engineering, fluid dynamics, thermodynamics, heat transfer, and applied mechanics. See Graduate Catalog for details.

## Mechanical Engineering Courses

**Note:** Do not purchase drafting instruments before first class in the next three courses:

**21. Engineering Graphics.** Development of spatial visualization. Graphical solutions involving points, lines, and planes. One lecture, two labs. (3F, W) **Nyman, Smith**

**22. Engineering Graphics.** Intersections, and developments, vectors, graphs, and pictorial drawings. Prerequisite: ME 21. One lecture, two labs. (3W, Sp) **Nyman, Smith**

**111, 112, 113. Engineering Thermodynamics.** Coverage of the basic laws and concepts of energy and energy transfer from a classical viewpoint; an introduction to statistical thermodynamics and thermodynamics considerations of compressible fluid flow; applications. Prerequisites: Physics 22 and Math 110 concurrently. Three lectures, three lectures, and four lectures. (3F, 3W, 3Sp) **Vendell**

**116, 117. Engineering Heat Transfer.** One and two-dimensional steady state conduction, laminar and turbulent flow, convective heat transfer, natural convection, radiation, transient and periodic heat transfer, applications and laboratory tests. Prerequisites: ME 111, CE 140, and ME 160; ME 116 is a prerequisite for ME 117. Three lectures. (3W, 3Sp) **Holdredge**

**119. Thermodynamic Systems.** Application of the laws, concepts, and procedures of thermodynamics, and gas dynamics to turbo-machinery, propulsion, gas and vapor turbine cycles, expanders and compressors, and other apparatus. Both analytical and experimental approaches. Prerequisites: ME 117 and 143 concurrently. Three lectures and one lab. (3Sp) **McKay**

**120. Engineering Measurements.** Basic engineering measurements, theory and techniques; error analysis, data reduction and rejection; analysis of data by graphical, statistical, and mathematical means; experiment planning. Prerequisites: Math 40 and 99. Three lectures, one lab. (4W, Sp, Su) **Watkins**

**130. Kinematics of Machines.** Analysis of displacement, velocity, and acceleration in mechanisms by graphical and analytical methods. Velocity and acceleration polygons. Kinematic design of cams, belts, toothed gearing, gear trains, computing mechanisms, etc. Introduction to synthesis. Complex numbers in kinematics. Calculation of velocities and accelerations by complex numbers. Prerequisite: ME 161 or permission of instructor. Two lectures, one lab. (3F, 3Sp) **Harris**

**131. Machine Analysis.** Basic analytical tools for the design of machines. Application of principles of engineering mechanics, strength of materials, and kinematics in machine analysis. Combined stresses; theories of failure; variable loads, repeated and impact; fatigue; stress concentration; statically indeterminate members; thick shell cylinders; flat plates; critical speeds; materials and dimensioning. Prerequisites: CE 103, ME 130. Three lectures, one lab. (4F) **Harris**

**132. Machine Design.** Application of the method of stress analysis to the design of machine components. Analysis of static and dynamic forces and stresses in machine elements. Design of machine part by rationalization and empiricism. The main topics are: fastenings, power screws, pressure vessels, springs, shafting, coupling, clutches and brakes, bearings with sliding and rolling contact, lubrication, gearing, etc. Prerequisite: ME 131. Three lectures, one lab. (4W) **Harris**

**133. Machine Design Projects.** Design project and report course covering design procedure and application of general theories of machine design including design of mechanical systems involving stress analysis and dynamics. Students work individually or in small groups under active guidance of staff members on approved design projects. References are made to research publications and experimental procedures. Prerequisite: ME 132. Two lectures, two labs. (4Sp) **Harris**

**135. Dynamics of Machinery.** Course covers dynamics of rigid bodies, vibrations and control systems. Emphasis is on physical concepts and applications. Treats all aspects of dynamics as a unified, coherent body. Prerequisite: Approval of Instructor. Three lectures. (3W) **Harris**

**143. Gas Dynamics.** Fundamental concepts of fluid mechanics and thermodynamics, isentropic flow, shock waves, constant area flow, flow with heating, generalized one dimensional flow. Prerequisite: ME 112. Three lectures. (3Sp) **Vendell**

**150, 151. Science of Materials.** The basic principles of solid state physics are used to explain the engineering properties of materials including metals, alloys, ceramics, plastics, etc., with temperature range from ultra-high

to cryogenic. Prerequisite: Physics 22. ME 150 is prerequisite to ME 151. Three lectures. (3W, 3Sp) **Supe**

**160. Engineering Analysis.** Many of the mathematical tools which are used in Senior and graduate courses are introduced and applied to sample problems from fluid mechanics, advanced dynamics, gas dynamics, thermodynamics, and heat transfer. Specific topics include the mean value theorems, vector calculus, derivation of differential equations, line integrals, and Fourier Series. Prerequisite: Math 110. Four lectures. (3F) **Vendell**

**161. Introduction to Advanced Dynamics.** Motion of a particle, motion of a system of particles, moving reference frames, motion of a rigid body, conservation of linear and angular momentum, conservative and non-conservative force fields, Euler's equations, Hamilton's principle, Lagrange's equations for holonomic and non-holonomic systems. Prerequisites: CE 92 and ME 160. Three lectures. (3W) **Moser**

**162. Mechanical Vibrations.** Free, damped, and forced vibration of systems with  $n$  degrees of freedom, matrix iteration technique, the method of Holzer, vibration of elastic bodies. Prerequisite: ME 161 or permission from Instructor. Three lectures. (3F) **Moser**

**165. Mechanics of Materials.** Development of various theories of failure and stress-strain relationships as they apply to problems of direct and shearing loads, flexure, and torsion; and with special application to thick-walled cylinders, discs, curved beams, unsymmetrically and eccentrically loaded members; and photoelastic analysis. Prerequisites: Math 110 and CE 103. Four lectures. (4W) **Watkins**

**166. Introduction to Continuum Mechanics.** Introduction and application of tensors as applied to the mechanics of solid or fluid continua. Tensor properties of stress, strain, and strain rate. General discussion of Cartesian tensors. Equations of motion and compatibility. Relations between stress, strain, and strain rate; for anisotropic and isotropic elastic, plastic, and viscous solids; and for compressible viscous fluids. Beltrami-Michell equations and Navier-Stokes equations. Prerequisite: CE 103. Recommended ME 165. Three lectures. (3F) **Moser**

**183. Refrigeration and Air Conditioning.** Principles of heating, ventilating, and cooling systems. Psychrometric processes. Basic refrigeration processes. Prerequisite: ME 116. Three lectures, one lab. (4W) **McKay**

**187. Internal Combustion Engines.** Thermodynamic analysis of cycles in internal combustion engines. Combustion, fuel systems, and auxiliaries for both piston and turbine type engines. Prerequisite: ME 116. Three lectures. (3Sp) **McKay**

## 210 College of Engineering

**190, 191, 192. Nuclear Engineering.** Atomic and nuclear theory; nuclear reactions and radiations; nuclear reactor theory; reactor instrumentation and control; radiation monitoring and safety; radiation shielding; reactor fuels and fuel processing; thermal aspects of reactors; type of reactors. Three lectures. (3W, 3Sp, 3F) **Shupe**

**193, 194, 195. Nuclear Reactor Laboratory.** May be taken concurrently with ME 190, 191, 192. One lab. (1F, 1W, 1Sp) **Shupe**

**197. Honors Studies.** Advanced work for qualified students. Work is initiated by a 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 credits, arranged. (F, W, Sp) **Staff**

**198. Mechanical Engineering Seminar.** Selected topics of interest to Mechanical Engineers are presented and discussed by members of the class and specially qualified visitors. Prerequisite: Senior standing in Mechanical Engineering. Two lectures. (1F, W, Sp) **Shupe**

**199. Special Problems.** Formulation and solution of theoretical or practical problems which relate to Mechanical Engineering. Comprehensive report required. Prerequisite: Senior classification and permission of Head of Department. (3F, W, Sp) **Staff**

**202. Introduction to Plasticity.** The analysis of stresses, deformation, and collapse in devices constructed of plastic material. Prerequisite: ME 166. Three lectures. (3Sp) **Staff**

**205. Introduction to Elasticity.** The interrelationship of stresses and/or strains, properties of the material, and the configuration of an elastic media under a given load. Prerequisite: ME 166. Three lectures. (3W) **Moser**

**206. Theory of Elasticity.** A continuation of ME 205; elementary problem in three dimensions; two dimensional problems solved by Airy's Stress Function; complex variables and conformal mapping as applied to elasticity problems; and other advanced techniques. Prerequisite: ME 205. Three lectures. (3Sp) **Moser**

**210. Transport Phenomena.** Systematic and parallel treatment of momentum transfer (viscous flow), heat transfer, and mass transfer. Treatment stresses similarities. Prerequisites: ME 117 and ME 166 concurrently. Three lectures. (3F) **Holdredge**

**211, 212. Advanced Thermodynamics.** Advanced topics of classical and statistical thermodynamics. Prerequisite: ME 113. Three lectures. (3F, 3W) **Vendell**

**216, 217, 218. Advanced Heat and Mass Transfer.** Advanced topics concerning mass transfer and heat transfer by conduction, convection, and radiation. Prerequisite: ME 210. Three lectures. (3W, 3Sp, 3Su) **Holdredge**

**230. Advanced Kinematics.** Review of vector analysis; analytical methods: complex numbers and their application in kinematic analysis and synthesis; geometry of constrained motion; the Euler-Savary equation; Hartmann's Construction; Bloch Synthesis; Freudenstein's Theorem; the Hrones-Nelson synthesis of the four-bar linkage; the analysis of space mechanism. Prerequisite: ME 130. Three lectures. (3Sp) **Eisenstein**

**240, 241, 242. Intermediate Gas Dynamics.** Intermediate topics in the flow of compressible fluids, shock, boundary layer theory, flow tables, thermodynamic considerations. Prerequisites: ME 117, 143. Three lectures. (3F, 3W) **McKay**

**251. Propellants.** The physical chemistry of propellants and propellant combustion with special emphasis on the performance of solid and liquid propellants in rocket engines. Three lectures. (3F) **Staff**

**261, 262. Theory of Vibrations.** Review of vibrations of linear systems, finite degrees of freedom. Normal modes and material frequencies by matrix methods. Non-linear systems. Graphical methods. Analog and digital computer techniques. Analysis of transverse, longitudinal, torsional, and flexural vibrations in continuous elastic media. Prerequisite: ME 162. Three lectures. (3W, 3Sp) **Moser**

**273. Special Problems in Mechanical Engineering.** Independent or group study of engineering problems not covered in regular course offerings. Time and credit arranged. (F, W, Sp) **Staff**

**274. Special Studies in Mechanical Engineering.** Special registration for students who have obtained the maximum number of credits for the thesis or Plan B Report, who have not yet completed the writing of the thesis or Plan B Report, and who are not registered for other courses. Time and credit arranged. (F, W, Sp) **Staff**

**290, 291, 292. Nuclear Reactor Engineering Principles.** Transport theory and neutron diffusion; homogeneous reactors with and without reflector; heterogeneous reactors; reactor materials; design, operation, and control of nuclear reactors; reactor kinetics. Three lectures. (3F, 3W, 3Sp) **Shupe**

**293, 294, 295. Nuclear Reactor Laboratory.** One laboratory. (1F, 1W, 1Sp) **Shupe**

**298. Graduate Thesis.** Credit arranged. (F, W, Sp, Su) **Staff**





*COLLEGE OF FAMILY LIFE*



College of

## Family Life

Department of Clothing and Textiles, 216

Department of Family and Child Development, 221

Department of Food and Nutrition, 224

Department of Homemaking Education, 229

Department of Household Economics and Management, 231

General Major in Family Life, 234

Combination Major in Family Life and Office Administration, 235

Degrees Offered:

Bachelor of Arts

Bachelor of Science

Master of Science

Doctor of Philosophy

*College of*

# Family Life

Phyllis Snow, Dean  
Office in Family Life 201

Family Life, like law and engineering, is a field of study rather than a discipline in the usual sense of that word, but it has become one of the most important fields of learning in our civilization. It is the field of knowledge and service primarily concerned with educating the individual for family living; improving the services and goods used by families; conducting research to discover the changing needs of individuals and families and the means of satisfying these needs; and furthering community, national, and world conditions favorable to family living.

The changing status of women, populations shifts, the great humanitarian movement in the free world, technological advancements, and the needed supplementary services for such groups as employed homemakers, the aged, and the handicapped clearly imply the need for research, education, and other professional services aimed at improvement of homes and betterment of family living. Further, the things that have to do with families—children, food, clothing, houses—are at the heart of the nation's economy, and much of what interests people in normal living centers on the family. The field provides the research and education which enhances and preserves our culture's skills in the vital areas of food, clothing, and family nurture.

While we are grateful for the material progress which science has brought, if the major problems

of mankind are ever to be solved, the solution must come not from formulae or statistical tables, but from the nursery, the kitchen, and the family-conditioned consciences of a better prepared generation.

Today, many of the activities assigned to the homes have become industrialized and the family is increasingly a unit of consumption. Thus, management of family resources (knowledge, personal attributes, time, energy, and money, goods and services), the development of individuals within the family, and the establishment of family-community relationships have become more important than the production of goods and services. The growth of service industries requires that Family Life specialists increasingly apply their knowledge in institutional settings, and preparation for professional competency has become a major function of our program.

All qualified family life specialists are college graduates and many hold advanced degrees. They are much in demand as teachers in facilities for children, in home economics and distributive education programs in the secondary schools, and in the specializations at the college level; as extension home economists; as consultants and educators in social welfare programs; as dietitians, public health nutritionists, food service directors, and school lunch supervisors; as home service personnel with public utility companies; research workers or technicians in commercial laboratories; business

home economists with food, equipment, housing, and textile companies; designers of clothing, textiles, and home interiors; executives in retail clothing and home furnishings departments; as consultants for radio and television, and as members of editorial staffs of magazines and newspapers. They are planning the food for the crews exploring outer space and cruising under the seas; they are aiding in the rehabilitation of the nation's handicapped children and adults; volunteering in the Peace Corps around the world, and contributing greatly to the cause of humanity through their professional skills.

In terms of financial rewards they receive the top three highest starting salaries in the country. According to statistics supplied by the Women's Bureau of the United States Department of Labor, the average salary of all the family life teachers in the secondary schools is \$5,000; that of the college and university faculty, \$6,000; and of federal government employees, \$4,345 to \$15,030, depending upon education, experience, and position held.

Students may work toward the bachelor's degree in any of the five departments of the College: Clothing and Textiles, Family and Child Development, Food and Nutrition, Household Economics and Management, and Home Economics Education. Programs interrelate the work of all departments and many related fields throughout the university. Curricula are designed to provide for a liberal education—as a person, a citizen, and a family member, and for professional competency. They are based on departmental major and minor requirements together with the University general education requirements. Creative work experience is matched with formal study.

## Majors

Majors and possible areas of emphasis within them are listed below and described in the following pages.

**Clothing and Textiles:** General Clothing and Textiles; Fashion Merchandising; Fashion Design; Textile Technology and Research; Composite in Fashion Merchandising, Business Education and Distributive Education.

**Family and Child Development:** Composite of Child Development and Elementary Education; Marriage and Family Relations.

**Food and Nutrition:** Foods; Nutrition and Dietetics; Food Service and Business; Research in Food and Nutrition.

**Homemaking Education:** Composite for Secondary School Teaching and Extension Work.

**Household Economics and Management:** Home Management and Family Economics; Housing and Equipment.

**Family Life:** Family Life and Office Administration; General Family Life.

Each of the departments is well equipped and has up-to-date facilities for teaching and conducting research. An excellent foundation for graduate study is provided for the student who wishes to continue beyond the bachelor's degree. All departments offer the Master's degree, and the Clothing and Textiles and Food and Nutrition departments offer the Doctor's degree. The Institute for Research on Man and His Personal Environment, established in 1967, provides opportunities for the study of man as a totality with respect to his physical, social, and psychological responses to his environment, particularly clothing, textiles, home furnishings, and housing.

Generally, the first two years of study are devoted to obtaining a "liberal" education and completing the prerequisite courses in the College and related fields. Thus, the student has time to study possibilities in all areas before choosing the one best suited to his individual needs and interests. The Bachelor's degree is earned by fulfilling the requirements in the chosen curriculum.

Sufficient flexibility is provided to:

**Capitalize on individual interests and abilities.** For example, the science-minded may choose a family life major in which chemistry and physics play a dominant role. For those interested in commercial art, the study of design may pave the way to a career in fashion illustration, design of kitchen equipment, or any of the numerous related careers in the art-family life field. Similarly, a minor in journalism can lead to such jobs as the writing or supervision of advertising copy for home and family products; or the presentation of consumer goods via the media of newspapers, magazines, radio, or television. Education courses in home economics are requisite for the student who plans to become a home economics teacher. The latter field now claims 44,000 women in the United States alone.

**Provide for individual needs.** For example, some students arrange for double majors to prepare for teaching and extension work, teaching in nursery school and the elementary grades, or for clothing retailing and teaching.

An Honors program is provided for those students with a potential for unusual scholastic achievement. To be eligible, students must meet the requirements given on page 35 of the Catalog.

Each student has a qualified adviser to help with decision making. All entering students and their parents are encouraged to participate in one of the summer orientation programs.

The following Family Life courses are available for students in each department of the College:

**197. Honor Studies.** Advanced work for students approved by the College of Family Life Honors Committee. Special projects initiated by the student may be conducted under the direction of a faculty member or advanced study may be pursued in connection with an established departmental course. (3F, W, Sp)

**Staff**

**198. Honors Seminar.** For qualified students approved by the College of Family Life Honors Committee. Exploration of concepts and problems of an interdisciplinary nature which have a common core within the various fields of Family Life, such as creativity, consumerism, and problems of people at various stages of the family life cycle. Emphasis is placed on the dynamic interrelations between all processes in the behavior and development of the individual within a family setting. (2W)

**Staff**

**293. Research Methods.** Research methodology for case studies, surveys and experiments; design and style for thesis and research reports; application of measurements and statistical techniques to professional problems in Family Life. A research report presenting and analyzing findings of a study in the student's major field is required. (3F)

**Compton**

Men and women in all colleges and departments of the University may take courses in the College of Family Life provided they have the prerequisite courses where these are required. Students may select courses most appropriate to their personal needs and interests.

Department of

## Clothing and Textiles

**Head:** Professor Norma H. Compton  
Office in Family Life 303

**Associate Professors** Ruth Hawthorne, Theta Johnson, Lillian Matthews; **Assistant Professor** Virginia Lewis; **Instructors** Ruth V. Clayton, Susan Richards.

**Degrees:** Bachelor of Science (BS), Bachelor of Arts (BA), Master of Science (MS), Doctor of Philosophy (PhD)

**Majors:** General Clothing and Textiles, Fashion Merchandising, Fashion Design, Textile Technology and Research, Composite in Fashion Merchandising, Business Education and Distributive Education.

All manufacturers of clothing want graduates who have a flair for clothes. Ability to make clothes, though desirable, is not as essential as the ability to see possibilities and coordinate ideas. Employers want graduates who understand the needs and resources of consumers, who can help them select beautiful and yet practical garments, who understand the market place and the total clothing and textile industry, and who can and do make sales that result in consumer satisfaction, as well as a profit. It is the purpose of the Clothing and Textiles Department to train graduates to fill this need.

## Undergraduate Study

## General Clothing and Textiles Major

This major provides preparation for positions such as consultant or educational director for a pattern company, woman's magazine or department store; instructor in a trade school; or designer and seamstress in a custom dressmaking establishment. A supporting minor should be developed from

the Social Sciences, Economics, or Art depending upon student interests. The curriculum includes the following courses:

Course	Credits
CT 5 Design in Everyday Living .....	3
CT 10 Pattern Designing and Clothing Construction .....	3
CT 24 Introduction to Textiles .....	3
CT 75 Home Furnishings .....	3
CT 105 Clothing Selection and Consumption .....	2
CT 106 Behavioral Science Aspects of Clothing .....	2
CT 115 Fashion Design .....	3
CT 120 Comparative Construction Techniques .....	5
CT 135 History of Costume and Textiles .....	5
CT 140 Draping .....	3
CT 170 Advanced Flat Pattern Designing .....	3
CT 174 Advanced Textile Problems .....	3
CT 180 Tailoring .....	3
CT 186 Fashion Analysis .....	3
CT 191 Seminar .....	2
CT 195 Couturier Design .....	1

Students selecting this emphasis should take additional work in one or more of the following areas after consultation with the adviser: Anthropology, Art, Psychology, Sociology, Economics, Philosophy, Political Science, and History; and in other departments within the College of Family Life.



## Fashion Merchandising Major

Education in Fashion Merchandising is preparation for such positions as buyer or assistant buyer, comparison shopper, fashion stylist or coordinator, merchandise manager, fashion market reporter, fashion promoter, or owner-manager of small store. A minor should be completed in Business Administration. The curriculum includes the following courses:

### Major:

Course	Credits
CT 5 Design in Everyday Living .....	3
CT 10 Pattern Designing and Clothing Construction .....	3
CT 24 Introduction to Textiles .....	3
CT 75 Home Furnishings .....	3
CT 105 Clothing Selection and Consumption .....	2
CT 106 Behavioral Science Aspects of Clothing .....	2
CT 115 Fashion Design .....	3
CT 135 History of Costume and Textiles .....	5
CT 174 Advanced Textile Problems .....	3
CT 186 Fashion Analysis .....	3
CT 191 Seminar .....	2
CT 192 Field Experience in Clothing & Textiles .....	Arr

Minor (18 credits taken from the following list)

Acct 100 Survey of Accounting Principles .....	4
BA 63 Salesmanship .....	2
BA 133 Management Concepts .....	3
BA 151 Marketing .....	5
BA 156 Principles of Advertising .....	5
BA 161 Principles and Problems in Retailing .....	5
Psy 155 Psychology of Business and Industry .....	3

Also, for proficiency in this field, majors should use some of their electives to complete:

FA 57 Photography Fundamentals .....	3
Spch 181 Television Production .....	3
Spch 184 TV Writing .....	3

### Fashion Merchandising for Men.

Men choosing this major may substitute other courses for the two in clothing construction required of women.

## Fashion Design Major

This major is planned for students interested in apparel design-

ing. The supporting minor should be from Fine Arts. The curriculum includes the following courses:

### Major:

Course	Credits
CT 5 Design in Everyday Living .....	3
CT 10 Pattern Designing and Clothing Construction .....	3
CT 24 Introduction to Textiles .....	3
CT 105 Clothing Selection and Consumption .....	2
CT 106 Behavioral Science Aspects of Clothing .....	2
CT 115 Fashion Design .....	3
CT 120 Comparative Construction Techniques .....	5
CT 135 History of Costume and Textiles .....	5
CT 140 Draping .....	3
CT 170 Advanced Flat Pattern Design .....	3
CT 180 Tailoring .....	3
CT 186 Fashion Analysis .....	3
CT 191 Seminar .....	2
CT 192 Field Experience in Clothing & Textiles .....	Arr.
CT 195 Couturier Design .....	1

### Minor:

Art 5 Beginning Design .....	3
Art 11 Water Coloring .....	3
Art 104 Life Drawing .....	3
Art 115, 116 Fabric Design .....	6
Art 135 Color .....	3
BA 151 Marketing Principles .....	5
BA 156 Advertising .....	5

The student interested in costume design for the theatre may wish to use electives for:

ThA 152 Stage Costuming .....	2
ThA 153 Costume Design .....	3

It is highly recommended that students selecting this emphasis develop proficiency in French. Recommended are:

L Fr 1, 2, 3, Elementary French (or 2 years of high school French) ....	15
4A, 5A, 6A, Intermediate French .....	9

## Textile Technology and Research Major

Students preparing for positions in Textile Technology and Research should complete this major with a minor in Chemistry. The major provides an excellent background for graduate work in Clothing and Textiles. The curriculum includes the following:

**Major:**

Course	Credits
CT 5 Design in Everyday Living .....	3
CT 10 Pattern Designing and Clothing Construction .....	3
CT 24 Introduction to Textiles .....	3
CT 105 Clothing Selection and Consumption .....	2
CT 106 Behavioral Science Aspects of Clothing .....	2
CT 135 History of Costume and Textiles .....	5
CT 174 Advanced Textile Problems .....	3
CT 190 Independent Study .....	Arr
CT 191 Seminar .....	2
AS 175 Wool Technology .....	3
Ap St 131 Statistical Methods .....	4
FA 5 Beginning Design .....	3
FA 115, 116 Fabric Design .....	6

**Minor:**

Chem 20, 21, 22 Chemical Principles and Qualitative Analysis .....	15
Chem 115 Quantitative Analysis .....	4
Chem 121, 122 Organic Chemistry .....	8
Engl 111 Technical Writing .....	3

### Composite Major in Fashion Merchandising, Business Education and Distributive Education

The curriculum for those students interested in Fashion Merchandising who also wish to certify to teach Business and Distributive Education includes:

**Clothing and Textile Courses**

Course	Credits
CT 5 Design in Everyday Living .....	3
CT 24 Introduction to Textiles .....	3
CT 105 Clothing Selection and Consumption .....	2
CT 186 Fashion Analysis .....	3
CT 192 Field Experience in Clothing and Textiles .....	3-6

Nine additional credits selected from:

CT 15 Clothing Selection for Men .....	2
CT 106 Behavioral Science Aspects of Clothing .....	2
CT 115 Fashion Design .....	3
CT 135 History of Costume and Textiles .....	5

**Business and Distributive Education Courses**

Course	Credits
Acct 1, 2, or 100 Accounting .....	4-6
BA 4, 5 Business Law .....	4
BA 63 Salesmanship .....	2
BA 151 Marketing Principles .....	5
BA 156 Principles of Advertising .....	5
BA 161 Principles and Problems of Retailing .....	5

BE 150 Philosophy of Distributive Education .....	3
BE 155 Methods of Teaching DE and Cooperative BE .....	3
BE 178 Methods of Teaching Business .....	3-6
BE 185 Managing Personal Finances or HEM 155 Family Finance .....	3-5
BE 189 Principles of Business Education ..	3
OA 92 Business Machines .....	2

Students desiring a secondary school teaching certificate must meet the minimum requirements of the College of Education for such a credential.

Students may be recommended for graduation by either the College of Family Life or the College of Business and Social Sciences.

**Clothing and Textiles Minor**

Students wishing a minor in Clothing and Textiles should take Clothing and Textiles 5, 10, 24, 105, 106, and six credits selected from other courses included in the Clothing and Textiles major.

**Graduate Study**

**Master of Science Degree.** The Clothing and Textiles Department offers the Master of Science degree with research in the fields of Clothing or Textiles.

**Doctor of Philosophy Degree.** The Clothing and Textiles Department offers advanced study and research leading to the degree of Doctor of Philosophy in the Behavioral Science Aspects of Clothing and Textiles. To fulfill the requirements for the degree, the student must: 1) demonstrate a reading comprehension of one foreign language, 2) pass a comprehensive examination in the field of specialization and in the minor field of Psychology or Sociology and Anthropology, and 3) successfully complete a research problem and a satisfactory dissertation. The student should consult the Graduate Catalog or the Head of the Department concerning other requirements.

## Clothing and Textiles Courses

**5. Design in Everyday Living.** A study of the principles of design and color as related to the individual, the home, and family living. Recommended for all students in the University. (3F, W, Sp) **Hawthorne, Richards**

**10. Pattern Designing and Clothing Construction.** Application of construction, fitting, and alteration principles with commercial patterns. Introduction to principles of flat pattern design and pattern making. (3F, W, Sp) **Hawthorne, Lewis**

**\*14. Fashion Figure Drawing.** A basic course primarily to introduce the importance of proportion and balance in drawing a fashion figure, the transition from the natural figure types to the fashion figure types, which would include men as well as women and children. Students will also be instructed to clothe the figure and use techniques for the quick and realistic sketching of all types of materials for the professional field of designing. Prerequisite: Art 104. (3F) **Lewis**

**15. Clothing Selection for Men.** Men's apparel as related to the wearer. Consideration is given to fundamentals of fabric and garment selection. Organized to meet the needs of students in all colleges of the University. (2F, W, Sp) **Richards**

**24. Introduction to Textiles.** A study of fibers, yarns, fabric construction and finishes as related to the appreciation, selection, use and care of current textiles. (3F, W, Sp) **Richards**

**75. Home Furnishings.** Characteristics of home furnishings in relation to their classification, design, respective quality, use and care. Local field trips. (3F, W, Sp) **Lewis**

**105. Clothing Selection and Consumption.** Analysis of clothing needs of men, women, and children at various stages of the life cycle. Factors affecting clothing expenditures; production and distribution of textile products for the consumer market. Emphasis is placed upon clothing selection in relation to aesthetic and economic influences. (2W, Sp) **Matthews**

**106. Behavioral Science Aspects of Clothing.** Clothing as a reflection of culture and personality. Analysis of clothing within selected primitive and contemporary cultures in relation to societal value structures. Study of the effects of clothing on the development, and adjustment of the individual self. (2F, W) **Matthews**

**\*\*114. Fashion Illustration.** Instruction will be given on fashion techniques in line and halftone in drawing the figure in fashion proportions for the newspaper, magazines, and

reproduction for the professional field. Included in the course will be designing for the professional field through the drawing of fashions, as well as fashion accessories for women, men and children. Prerequisite: CT 14. (3F) **Lewis**

**115. Fashion Design.** Fashion designing for reproduction, considering the wearer, the fabric, and the ensemble. Sources of inspiration for fashion designing. Individual experimentation through sketching with application directly to fabrics. (3Sp) **Lewis**

**120. Comparative Construction Techniques.** Development of judgment, originality, and skill in clothing construction with emphasis on alternative techniques and intricate construction details. Prerequisite: CT 10. (5F, W, Sp) **Lewis**

**135. History of Costume and Textiles.** A study of costume and textiles development from ancient times to the present as related to the socio-economic, cultural, and political influences of the times and their importance in the evolution and inspiration of modern textiles and dress. (5F) **Clayton**

**\*\*140. Draping.** Creative experiences in dress design by draping fabric on the dress form. Emphasis is placed on fitting and the effect of pattern, grain, and textures on design and dress. Problems consist of making a French lining and draping two garments. Prerequisite: CT 120. (3F) **Hawthorne**

**\*170. Advanced Flat Pattern Designing.** Application of the principles of dress design to the construction of patterns by flat pattern method. Emphasis is placed on the development and use of a basic sloper, and on the interpretation of a design in relation to clothing construction principles and in the making and designing of patterns. Prerequisite: CT 120. (3F) **Hawthorne**

**174. Advanced Textile Problems.** Emphasis is placed on recent textile advances and research techniques. Consideration is given to physical and chemical testing and use of the microscope in identification of fibers. Prerequisite: CT 24. Recommended: Chem 10, 11, 12. (3W) **Richards**

**180. Tailoring.** Application of tailoring techniques in the construction of suits and coats. Emphasis is placed on developing judgment and skill in the use of alternative techniques. Prerequisite: CT 120. Recommended: CT 170. (3W) **Clayton**

**186. Fashion Analysis.** Socio-economic factors underlying fashion; fashion designers and markets; analysis of fashion media—in-

\*Taught 1968-69

\*\*Taught 1969-70

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dustry publications, magazines, newspapers, radio and television; merchandise displays and fashion show production. Prerequisite: CT 105, 106 or consent of department. Recommended: Speech 181, Journ 184, Business Administration 156. (3Sp) **Matthews**

**190. Independent Study.** Credit arranged. (F, W, Sp, Su) **Staff**

**191. Seminar.** Reports and discussions on newer developments in the Clothing and Textiles field. (2W) **Staff**

**192. Field Experience in Clothing and Textiles.** Provides practical experience with fashion retail and design firms in the Utah area. Students work under the direction of a manager of an approved firm. A university supervisor will direct the program and meet periodically with students on a seminar basis. 2-12 cr. (F, W, Sp, Su) **Staff**

**195. Couturier Design.** A comprehensive analysis of the synthesis of knowledge and skill in clothing construction and design. Prerequisites: CT 120, 140, 170. (1Sp) **Clayton**

**197. Honors Studies.** See Family Life 197. Credit arranged. (F, W, Sp, Su) **Staff**

**198. Honors Seminar.** See Family Life 198. (2W) **Staff**

**204. Economics of Clothing and Textiles.** Study of current theories and research on consumer clothing-oriented behavior; factors affecting the production, distribution, and consumption of clothing and textile products; the role of the clothing and textile industries in the national economy. (3Sp) **Matthews**

**205. Consumer Behavior in Clothing and Textiles.** Emphasis is placed on the behavioral science concepts of consumer behavior as these apply to the utilization of knowledge of current textile and clothing technology, standards for manufacture, and legislation. Consumption patterns of textiles and clothing are also studied. (3F) **Matthews**

**206. Advanced Behavioral Science Concepts in Clothing.** Analysis and synthesis of basic concepts of cultural anthropology, sociology, and psychology with implications for clothing and textiles. Interpretation of research findings. Formation of new hypotheses based upon the conceptualizations studied. (3F) **Compton**

**208. Cultural Bases of Clothing.** Study of clothing as a communicative device with respect to technological advancement, societal values, and social role enactment. Analysis includes detailed consideration of the concepts of beauty, acculturation, symbolism, modesty, social stratification, and reference group theory applied to clothing-oriented behavior. Prerequisite: CT 206. (3W) **Matthews**

**210. Personality Projection Through Clothing.** A developmental approach to the study of clothing. Emphasis is placed upon the interrelationships among the self, the body, and clothing at each stage of the life cycle. Detailed consideration will be given to the processes of differentiation-integration, identification, self-structure, self-valuation, and self-adjustment in relation to clothing-oriented behavior. Prerequisite: CT 206. (3Sp, Su) **Compton**

**\*280. Graduate Seminar: Clothing and Textiles in Education.** Study of contemporary issues and philosophy in clothing and textiles subject matter in relation to general educational objectives at all levels of learning. Clothing and textiles programs in secondary and higher education, cooperative extension, and continuing education will be considered, as well as the area of vocational education. (2W) **Matthews**

**\*281. Graduate Seminar: Aesthetic Aspects of Dress.** To identify aesthetic concepts of dress and appearance and relate them to generalizations from philosophy and psychology. To consider theoretical and empirical approaches to the study of aesthetics as a basis for better understanding the aesthetics of dress. (2Sp) **Hawthorne**

**\*\*282. Graduate Seminar: Textile Technology.** A study of various aspects of textile technology and fabric maintenance. Emphasis will be placed on problems such as soiling, laundering, shrinkage, weathering, colorfastness, biological factors, and wrinkle resistance. Current research in these areas will be of greatest concern. (2W) **Richards**

**290. Independent Study.** Credit arranged. (F, W, Sp, Su) **Staff**

**\*\*291. Graduate Seminar: Current and Special Topics.** A study of current trends and issues applying to specialized fields in clothing and textiles. Gives opportunity for investigation and reporting of individual problems. (2Sp) (Maximum 6) **Hawthorne**

**293. Research Methods.** Research methodology for case studies, surveys, and experiments; design and style for these and research reports; application of measurements and statistical techniques to professional problems in Family Life. A research report presenting and analyzing findings of a study in the student's major field is required. (3W) **Compton**

**294. Research Colloquium.** Discussion of advanced theories and research in Clothing and Textiles. Analyses of dissertations and other ongoing research projects. (1F, W, Sp, Su) **Compton**

**295. Research and Thesis.** Credit arranged. (F, W, Sp, Su) **Staff**

\*Taught 1968-69

\*\*Taught 1969-70

Department of

# Family and Child Development

**Head: Professor Don C. Carter**  
Office in Family Life 215

**Professor C. Jay Skidmore; Associate Professor Dorothy B. Lewis; Assistant Professors Carroll C. Lambert, Jay D. Schvaneveldt; Instructor Jane Mecham; Lecturer Alison Thorne; Head Teacher Cooperative Nursery School Valera G. Holman.**

**Degrees:** Bachelor of Science (BS), Master of Science (MS)

**Majors:** Marriage and Family Relations, Composite major in Child Development and Elementary Education.

Employers of men and women in family relationships, child development, or family finance want graduates who understand human growth and development and are acquainted with the wide range of kinds of families in this world, with families' widely differing motivations, resources, interpersonal practices, and moral standards. They want to employ persons who are skilled in lifting the sights of men, women, and children to ideals and values in human relationships previously undreamed of. The purpose of the Department of Family and Child Development is to prepare graduates to fill these positions.

Plus 18 credits selected from the following courses according to the interest of the student:

Course	Credits
FCD 77 The Child from Six to Twelve ....	3
FCD 115 Growth of the Infant .....	3
FCD 120 Marriage .....	3
FCD 125 Materials and Procedures in Family Life Education .....	3
FCD 140 The Family in Its Social Setting .....	3
FCD 150 Seminar .....	2
FCD 164 Nursery School Planning and Administration .....	3
Educ 116 Curriculum and Methods for Kindergarten .....	3
Art 50 Art for Young Children .....	3
or	
Art 151 Art Methods for Elementary Grades .....	3
M 150 Music for Elementary Schools ..	3
ThA 54 Children's Theatre .....	3
ThA 56 Puppetry .....	3
FN 22 Principles of Nutrition .....	3
PE 81 Rhythms and Dramatic Games ....	2
PE 83 Techniques in Game Leadership .....	3
PE 111 Creative Rhythms for Schools ....	3
Ap St 122 Statistical Meth. for Soc. Sciences 4	
or	
Psy 112 Application of Statistics to Education and Psychology ....	3
Psy 123 Psychology for Exceptional Children .....	3
Psy 127 Psychology of Learning .....	3
Psy 145 Mental Hygiene .....	3
Psy 161 Social Psychology .....	3
Psy 170 Perception .....	3
Aud-Spch 70 Language, Hearing, and Speech Development .....	3
Spch 118 Story-Telling .....	5
Spch 122 Reading Poetry to Children ....	3

## Undergraduate Study

### Composite Major in Child Development and Elementary Education

The curriculum for a major in Child Development for students who wish to be certified to teach in Elementary Education includes:

#### Child Development

Course	Credits
FCD 108 Guidance of the Young Child ....	3
FCD 174 Nursery School Methods .....	3
FCD 175 Practice Teaching in the Nursery School .....	6



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Soc 92	Peoples and Cultures of the World .....	3
Soc 160	Comparative Family Systems .....	3
Soc 171	Juvenile Delinquency .....	3
Anthr 165	Culture and Personality .....	3
Zool 102	Human Genetics .....	5

### Certification

In addition to the CD major outlined above, the student wishing to certify to teach in kindergarten or elementary school must meet the requirements for an Elementary Education major plus a 20-credit teaching minor.

### Child Development Minor

The curriculum for this minor includes:

Course	Credits
FCD 67 Early Childhood .....	5
FCD 108 Guidance of the Young Child .....	3
FCD 174 Nursery School Methods .....	3
FCD 175 Practice Teaching in the Nursery School .....	6

Plus an additional three credits chosen from the other courses included in the CD major.

The minor is recommended particularly for men in such fields as Social Work and Elementary Education who, perhaps more than women in our culture, may benefit from an opportunity to study the young child in the setting of a child development laboratory.

### Marriage and Family Relations Major

The curriculum for a major in Marriage and Family Relations includes:

Course	Credits
FCD 67 Early Childhood .....	5
or	
FCD 100 Human Growth and Development .....	3
FCD 120 Marriage .....	3
FCD 125 Family Life Education .....	3
FCD 140 The Family in Its Social Setting .....	3
FCD 150 Seminar .....	2
FCD 180 Marriage Counseling .....	3
FCD 185 The Family in the Middle and Later Years .....	3
HEM 149 Home Management .....	3
HEM 155 Family Finance .....	3

Anthr 160	Comparative Family or Systems .....	3
Anthr 165	Culture and Personality .....	3
Psy 112	Application of Statistics to or Education and Psychology .....	3
ApSt 131	Statistical Methods .....	4
Zool 102	Human Genetics .....	5

Plus nine credits selected from supporting courses in related fields.

### Marriage and Family Relations Minor

The curriculum for a minor includes:

Course	Credits
FCD 120 Marriage .....	3
FCD 125 Family Life Education .....	3
FCD 140 The Family in Its Social Setting .....	3
FCD 180 Marriage Counseling .....	3
FCD 185 The Family in the Middle and Later Years .....	3
FCD 67 Early Childhood .....	5
or	
FCD 100 Human Growth and Development .....	3

Plus six credits selected from the other courses included in the major.

**Counseling Service.** The Department of Family and Child Development provides premarital, marriage, and family counseling for students as part of a university-wide counseling program under the direction of the Coordinator of Counseling Services. Application for counseling on such problems as mate selection, husband-wife relationships, and parent-child relationships may be made to the Department, or to the Coordinator of Counseling Services.

### Graduate Study

At the graduate level, programs are offered leading to the MS degree in either Child Development or Marriage and Family Relations. Individualization of emphasis may be provided by the selection of courses in such departments as Education, Psychology, and Sociology, as well as the other departments in the College of Family Life.

## Family and Child Development Courses

20. **Marriage and the American Family.** Marriage and family living in a dynamic society. Influence of social change on patterns of courtship, marriage and family living. (3F, W, Sp) **Skidmore, Staff**
67. **Early Childhood.** Family Living as a desirable background for the child. Cultural influence on childhood and behavior. Fundamentals of growth and development. A beginning concept of guidance. (5F, W, Sp) **Schvaneveldt, Mecham, and Staff**
77. **The Child from Six to Twelve.** Growth and development of the normal child from six to twelve years. Guidance principles implicit in the normal behavior of children at these age levels. Laboratory experience and observation. Prerequisite: FCD 67. (3F) **Lewis**
100. **Human Growth and Development.** Growth and development from birth to maturity. General behavior patterns characteristic of different levels of maturity; individual differences and needs. Prerequisites: Psychology 53 and FCD 67. (3F, W, Sp) **Carter**
108. **Guidance of the Young Child.** Review of development principles with emphasis on social and emotional growth; guidance philosophy, principles and techniques. Two lectures. Three one-hour labs weekly. Prerequisite: FCD 67. (3F, W, Sp) **Lewis, Mecham**
109. **Play-School Education.** Methods and materials for play-school in high school home economics programs. Laboratory experience in working with preschool children in play-school situations. Prerequisite: FCD 67. FCD 108 to be a prerequisite or parallel course. (5F, W, Sp) **Lewis**
115. **Growth of the Infant.** Readings in child development from conception to fifteen months of age, with discussion of infant care. Prerequisite: FCD 67. (3W) **Lewis**
120. **Marriage.** Engagement; marriage relationships; understanding of self. For men and women. (3F, W, Sp) **Carter**
125. **Family Life Education.** Study of parent, teacher and community needs in relations to problems of education for family life. In-service training for teachers and group leaders in family. (W) **Skidmore**
135. **Early Childhood and Deprivation.** Effects of deprivation on the preschool child and his family. Compensatory programs for economic deprivation: Project Head Start and the deprived child. (3F) **Carter**
140. **The Family in its Social Setting.** Family interaction with the environment. Family influences on children's creativity. Impact on families of our technological, affluent society. Family and technical change in other cultures. (3F, W, Sp) **Thorne**
150. **Seminar.** Study of topics in current literature plus independent reading selected according to interest. (2Sp) **Staff**
164. **Nursery School Planning and Administration.** Development of the nursery school movement. Problems of physical plant, equipment, public relations, staff and budgeting of the child care center. (3Sp) **Lewis**
174. **Nursery School Methods.** Methods and techniques of guidance of preschool children individually and in groups, with emphasis on the study of one child. Readings in research on preschool children. Must parallel FCD 175. (3F, W, Sp, Su) **Lambert**
175. **Practice Teaching in the Nursery School.** Experience in application of generalizations regarding guidance, growth, and development of children in the nursery school. For Juniors and Seniors who have had a substantial amount of professional course work, including FCD 108 and 164. Arrangements must be made for practice teaching well in advance of registration. (6F, W, Sp, Su) **Lambert**
180. **Marriage Counseling.** The philosophy, principles, and techniques of premarital and marriage counseling. (3F) **Skidmore**
185. **The Family in the Middle and Later Years.** Family development, and problems of grown children and their parents; parents on their own; understanding older family members. (3W) **Skidmore**
190. **Independent Study.** For qualified students upon consultation with the instructor. Credit arranged. (F, W, Sp, Su) **Staff**
197. **Honors Studies.** See Family Life 197. Credit arranged. (F, W, Sp, Su) **Staff**
198. **Honors Seminar.** See Family Life 198. (2W) **Staff**
205. **Child Psychology and Guidance.** See Psychology 205. (3F, W, Sp) **Frandsen**
208. **Seminar in Child Guidance.** Study and analysis of theories and philosophies of central importance in defining the nature, process, and structure of child guidance. (3Su) **Staff**
251. **Seminar in Family Relations.** Analysis of selected topics in family relations. (3W) **Carter**
252. **Seminar in Child Development.** Analysis of selected topics dealing with growth, behavior, and development of the child. (3F) **Schvaneveldt**
253. **Current Research in Child Development.** Review of new research dealing with the growth and development of young children. (3W) **Schvaneveldt**

254. **Current Research in the Family.** Review of new research dealing with family relationships. (3Sp) **Schvaneveldt**

267. **Deprivation in Early Childhood.** Effects of deprivation on the preschool child; application of nursery school methods and curriculum to children with restricted and limited backgrounds; the child and his family. (3Sp)

**Carter**

275. **Internship in Nursery Education.** Work with young children in a situation involving limited supervision and personal responsibility for program planning and direction. Emphasizes experimental methods in working with children, and development of insight into children's behavior. Credit arranged. (F, Sp, Su)

**Lambert**

278. **Practicum in Agencies Serving Children.** Experience in working in agencies serving children. Limited to advanced students who have completed FCD 174 and 175. Time and credit arranged. (F, W, Sp)

**Lambert**

280. **Marriage Counseling.** Theory and practice in premarital, marriage, and family counseling. (3W) **Skidmore**

281. **Marriage Counseling Practicum.** Supervised practice in marriage counseling in the university, community agencies, and private setting. (5F, W, Sp) **Skidmore**

287. **Family Theory and Frameworks.** Various theories and conceptual frameworks of family study are defined, explored, and delineated. Emphasis is on the concepts and basic assumptions employed by various frameworks. The history and development of each, the present emphasis, and projected usage of each framework is also considered. (3F) **Schvaneveldt**

290. **Independent Study.** For qualified students upon consultation with the instructor. Credit arranged. (F, W, Sp, Su) **Staff**

293. **Research Methods.** See Family Life 293. (3W) **Compton**

295. **Research for Master's Thesis.** Credit arranged. (F, W, Sp, Su) **Staff**

## Department of

# Food and Nutrition

**Head: Professor** Ethelwyn B. Wilcox  
Office in Family Life 111

**Professor** Phyllis R. Snow; **Associate Professors** Flora Bardwell, Amy R. Kearsley, Margaret Merkley; **Assistant Professors** Deloy C. Hendricks, Ruth Wheeler; **Instructor** Janel Dayton.

**Degrees:** Bachelor of Science (BS), Master of Science (MS), Doctor of Philosophy (PhD)

**Majors:** Foods, Food Service and Business, Nutrition and Dietetics, Research in Food and Nutrition

Employers in food and equipment businesses need persons knowledgeable in food preparation and the production of aesthetically satisfying food, in the use and care of equipment, and in demonstration and selling techniques. A high degree of skill is required, perfected as is that of the musician, surgeon, artist, or engineer. These skills should be accompanied by an understanding of the scientific theories underlying them. The Food and Nutrition Department prepares graduates for these positions.

## Undergraduate Study

### Foods Major

The Foods program prepares the student for professional opportunities in food laboratories, equipment manufacturing companies, and in demonstration or test kitchens of utility companies if Household Economics and Management courses are taken as a minor, or for positions in magazine and newspaper writing and in advertising and public relations provided an extended sequence of courses in

the communication arts is elected as a minor.

The following courses are included in the curriculum:

Course	Credits
FN 22 Principles of Nutrition .....	3
FN 23 Principles of Food Preparation .....	3
FN 25 Meal Management for the Family .....	3
FN 107, 108 Science in Relation to Food Preparation .....	6
FN 109 Experimental Foods .....	3
FN 143 Advanced Nutrition .....	5
FN 146 Food Processing in Relation to Consumer Goods .....	2
FN 147 Food Economics .....	2
FN 150 Seminar .....	1
FN 180 Quantity Food Preparation .....	5
Math 35 College Algebra .....	5
Math 46 Plane Trigonometry .....	5
Chem 20, 21 and 22 Chemical Principles and Qualitative Analysis .....	15
Chem 121 Organic Chemistry .....	4
Chem 180 Elementary Biochemistry .....	5
Biol 15 General Biology .....	5
Bact 70 General Bacteriology .....	5-6
Physiol 4 Human Physiology .....	5

It is recommended that elective credits be used for some of the following courses to support the major choice: HEM 100-Household Equipment, 110 - Advanced Equipment, 120 - Utility Company Internship, 149-Home Management, 150-Home Management House; CT 5 - Design in Everyday Living; An Sci 185 - Meats; Acct 100 - Survey of Accounting Principles; BA 151 - Marketing Principles; Chem 122 - Organic Chemistry; Econ 51 - General Economics, 52 - Economic Theory, 107 - Micro-Economic Theory; Soc 70 - Introductory Sociology; Ag Econ 163 - Intermediate Agricultural Marketing; Physics 20, 21, 22 - General Physics; Engl 112 - Advanced Expository Writing.

### Food Service and Business Major

The Food Service program prepares the student for work in profit-making food service units; cafeterias, catering units, coffee shops,

dormitories, and restaurants. A double major with Business Administration and a practicum in an approved food service unit are required. The curriculum includes the following courses:

#### Food Service

Course	Credits
FN 22 Principles of Nutrition .....	3
FN 23 Principles of Food Preparation .....	3
FN 107, 108 Science in Relation to Food Preparation .....	6
FN 140 Nutrition .....	5
FN 146 Food Processing in Relation to Consumer Use .....	2
FN 147 Food Economics .....	2
FN 180 Quantity Foods Preparation .....	5
FN 182 Institutional Organization, Management and Cost Control .....	4
FN 183 Determination of Large and Small Equipment Requirements for Food Service Units .....	3
Chem 10, 11 General Chemistry .....	10
Chem 12 Elementary Organic Chemistry .....	5
Biol 15 General Biology .....	5
Bact 70 General Bacteriology .....	5
Physiol 4 Human Physiology .....	5
An Sci 185 Meats .....	3
Pub Health 150 Environmental Sanitation .....	4
Practicum of 6 weeks to 3 months	

#### Business

Acct 1, 2, 3 Introductory Accounting ....	9
BA 131 Business Statistics .....	3
BA 133 Management Concepts .....	3
BA 134 Production .....	5
BA 150 Managerial Accounting .....	5
BA 151 Marketing Principles .....	5
BA 171 Personnel Administration .....	5
BA 172 Personnel Practices .....	5
Econ 51 General Economics .....	5
Econ 52 Economic Problems .....	5
Math 35 College Algebra .....	5
Math 60 Mathematics of Finance .....	3
Math 66 Introduction to Mathematical Analysis .....	5

Elective credits may well be used for: FN 25 - Meal Management for the Family; BA 4, 5, and 6 - Business Law, 136 - Procurement and Production Control, 137 - Production Management, 138<sup>2</sup> - Quantitative Methods for Production Management; 154 - Purchasing, 173 - Personnel Administration; Bact 120<sup>2</sup>, 121 - Food Microbiology; CT 15 - Clothing for Men, 24 - Intro-

<sup>1</sup>Pretests for FN 22 and 23 are given prior to registration for Fall Quarter and during examination week in December to students who apply for waiver of these two courses.

<sup>2</sup>May be exempt by examination.

duction to Textiles; Physics 6 - General Physics; Econ 125 - Trade-Unionism and Collective Bargaining, 127 - Social Security; Psy 155 - Psychology of Business and Industry, or Soc 158 - Human Relations in Industry.

### Nutrition and Dietetics Major

This program prepares the student for an internship and subsequent work in dietetics and/or administration in hospitals, clinics, school lunch programs or large food service units. Basic courses in Foods, Nutrition, Chemistry, and Physiology are required for the professional rank of dietitian. The following courses are included in the curriculum:

Course	Credits
<sup>1</sup> FN 22 Principles of Nutrition .....	3
<sup>1</sup> FN 23 Principles of Food Preparation .....	3
FN 25 Meal Management for the Family .....	3
FN 107, 108 Science in Relation to Food Preparation .....	6
FN 143 Advanced Nutrition .....	5
FN 145 Diet Therapy .....	5
FN 146 Food Processing in Relation to Consumer Use .....	2
FN 147 Food Economics .....	2
FN 150 Seminar .....	1
FN 180 Quantity Food Preparation .....	5
FN 182 Institution Organization, Management and Cost Control .....	4
FN 183 Determination of Large and Small Equipment Requirements for Food Service Units .....	3
Math 35 College Algebra .....	5
Math 46 Plane Trigonometry .....	5
Chem 20, 21, and 22 Chemical Principles and Qualitative Analysis .....	15
Chem 121 Organic Chemistry .....	4
Chem 180 Elementary Biochemistry .....	5
Physiol 4 Human Physiology .....	5
Biol 15 General Biology .....	5
Bact 70 General Bacteriology .....	5
Acct 100 Survey of Accounting Principles .....	4
Psy 53 Elementary General Psychology .....	5
Psy 106 Educational Psychology .....	3
Psy 155 Psychology of Business and Industry .....	3
or	
Soc 158 Human Relations in Industry .....	3

Other courses that are recommended include: FN 109 - Experimental Foods; Chem 122 - Organic Chemistry; HEM 100 - Household Equipment, 110 - Advanced Equip-

ment, 120 - Utility Company Internship, 149 - Home Management, 150 - Home Management House; CT 5 - Design in Everyday Living; An Sci 185 - Meats; FCD 100 - Human Growth and Development; Hmg Ed 120 - Methods in Teaching Homemaking; Soc 70 - Introductory Sociology; Econ 51 - General Economics, 52 - Economic Problems; BA 171 - Personnel Administration; Engl 112 - Advanced Expository Writing; Physics 3 - General Physics.

### Research in Food and Nutrition Major

The research program prepares students for graduate work in the field of Food and Nutrition and for technical laboratory positions. Basic courses in Foods, Nutrition, Chemistry, Mathematics, Physics, and Physiology are required of all students in this specialization.

Course	Credits
<sup>1</sup> FN 22 Principles of Nutrition .....	3
<sup>1</sup> FN 23 Principles of Food Preparation .....	3
FN 107, 108 Science in Relation to Food Preparation .....	6
FN 109 Experimental Foods .....	3
FN 143 Advanced Nutrition .....	5
FN 146 Food Processing in Relation to Consumer Use .....	2
FN 147 Food Economics .....	2
FN 150 Seminar .....	1
FN 180 Quantity Food Preparation .....	5
Math 35 College Algebra .....	5
Math 46 Plane Trigonometry .....	5
Physiol 4 Human Physiology .....	5
Biol 15 General Biology .....	5
Bact 70 General Bacteriology .....	5
Chem 20, 21, 22 Chemical Principles and Qualitative Chemistry .....	15
Chem 115 Quantitative Analysis .....	5
Chem 121, 122 Organic Chemistry .....	8
Chem 180 Elementary Biochemistry .....	5

Other recommended courses include: An Sci 185 - Meats; Physics 20, 21, 22 - General Physics - Science; Math 96, 97, 98, 99 - Analytic Geometry and Calculus; Ap St 51 - Elementary Statistics.

<sup>1</sup>Pretests for FN 22 and 23 are given prior to registration for Fall Quarter and during examination week in December to students who apply for waiver of these two courses.



## Food and Nutrition Minor

Students from all other colleges, as well as students from other departments of the College of Family Life, may select a minor in Food and Nutrition. A minimum of 18 credits is required. A supporting minor in Household Economics and Management, Food Marketing, Economics, Journalism, Chemistry, or Physics is recommended for any of the majors in this Department.

## Graduate Study

The MS degree is offered in Food or Nutrition. Through interdepartmental committees the MS and the PhD degrees are offered in Nutrition and Biochemistry and in Food Science and Technology. Curricula are arranged by the Graduate student's committee to meet special interests and the general requirements of the Graduate School. General requirements are given in the section on the Graduate School in this catalog and Graduate School Catalog. Detailed requirements may be obtained upon request from the department.

## Food and Nutrition Courses

### 15. Numbers and Units for Food Science.

Course is designed to teach a variety of topics common to basic courses in food chemistry and nutrition: use of the metric system; use of units and dimensions in the labeling of physical quantities; molecular basis of heat and use of different scales of temperature; use of numbers expressed in exponent form; and use of slide rule. Laboratory experiments are designed to illustrate and emphasize the use of these concepts in food preparation and nutrition calculations. One lecture with or without one laboratory. (1 or 2F) **Dayton**

122. Principles of Nutrition. The relation of food to health; factors influencing nutritive requirements; problems applicable to individual interests and needs. (3F, W, Sp) **Dayton**

123. Principles of Food Preparation. The influence of such factors as kind and proportion of ingredients, manipulation, and method of cooking on nutritive value and acceptability of foods. One lecture and two laboratories. (3F, W, Sp) **Dayton**

25. Meal Management for the Family. Planning, preparing and serving family meals with consideration of the nutritional needs and time, energy, and money resources of the family. Prerequisites: FN 22, 23. (3F, W, Sp) **Staff**

107. Science in Relation to Food Preparation. Scientific principles underlying modern food theory and practice. The relation to food preparation of the physical and chemical properties of proteins, starches, sugars, leavening agents, and pigments; the properties of true solutions and principles of crystallization; colloidal systems—gels, sols, foams, and emulsions. Laboratory experiments designed to illustrate the effect of varying ingredients and preparation procedures on the quality of food products. Prerequisites: Organic Chemistry, FN 23. (3F, W) **Staff**

108. Science in Relation to Food Preparation. Continuation of FN 107. (3W, Sp) **Staff**

\*\*109. Experimental Foods. Objective tests in food research. Development, execution, written and oral interpretations of individual problems. Prerequisite: FN 108, or permission of instructor. (3Sp) **Staff**

140. Nutrition. Fundamental principles of human nutrition and their application to the individual and family group. Laboratory problems include a dietary study, animal experimentation, and certain chemical analyses. For Home Ed majors. Three lectures and one laboratory. Prerequisites: FN 22, Organic Chemistry, and Physiol 4. (4F, Sp) **Wheeler**

143. Advanced Nutrition. The study of the various nutrients and their interrelations. Laboratory problems include energy and dietary requirements of humans, small animal studies, and some laboratory methods of nutritional analysis. For FN majors and graduate students. Four lectures and one lab. Prerequisites: FN 22, Biochemistry, and Physiol 4. (5W) **Wheeler**

145. Diet Therapy. Application of dietetic principles to health maintenance including dietary modifications necessary in pathological conditions, pregnancy, and childhood. Four lectures and one laboratory. Prerequisite: FN 143. (5Sp) **Wheeler**

\*146. Food Processing in Relation to Consumer Use. Methods of manufacture, preservation and storage of food products and their influences on the physical structure, chemical composition, and nutritive value of foods; re-

<sup>1</sup>Pretests in FN 22 and 23 are given prior to registration for Fall Quarter and during examination week in December to students who apply for waiver of these two courses.

\*Taught 1968-69

\*\*Taught 1969-70

quirements and specifications for quality standards; implications for the consumer in shopping for food. Prerequisite: FN 108 or consent of instructor. (2F) **Staff**

**\*\*147. Food Economics.** Availability and utilization of food as affected by national economic systems, methods of distribution and other relevant economic and cultural factors in relation to current and projected world and local nutritional problems. Prerequisite: FN 108 and one course in economics or consent of instructor. (2F) **Staff**

**150. Seminar.** Reports and discussion on current literature. (1Sp) **Staff**

**180. Quantity Foods Preparation.** Principles of food preparation applied to large quantity production; standardization of food quality, menu planning and study of production costs. The course is planned particularly for Juniors and Seniors majoring in dietetics and institutional management. Prerequisite: FN 108. (5F) **Wheeler**

**182. Institutional Organization, Management and Cost Control.** Principles of scientific management applied to large service units. Emphasis on organization of large food service units, on personnel management and human relationships, sanitation problems, food purchasing, record keeping and varied aspects of money management as it affects food service in institutions. Prerequisite: FN 180. (4W) **Wheeler**

**183. Determination of Large and Small Equipment Requirements for Food Service Units.** Factors governing quality, capacity, care of operation, and maintenance of institutional equipment; and arrangement of working units for maximum efficiency. Prerequisite: FN 182. (3Sp) **Wheeler**

**190. Independent Study.** Credit arranged. (F, W, Sp, Su) **Staff**

**197. Honors Studies.** See Family Life 197. Credit arranged. (F, W, Sp, Su) **Staff**

**198. Honors Seminar.** See Family Life 198. (2W) **Staff**

**200. Laboratory Methods in Nutrition Research.** This course is designed to teach basic techniques used in nutrition research through the chemical determinations of constituents in blood and urine of human subjects. Prerequisites: Organic Chemistry and Biochemistry. (3W) **Hendricks**

**201. Laboratory Methods in Nutrition Research.** Nitrogen balance study; mineral, and vitamin determinations. Prerequisite: FN 200. (2Sp) **Staff**

**203. Nutrition Research; Micro-Chemical Analysis.** Micro-chemical determinations of vitamin and other constituents in small amounts of blood. Prerequisites: Organic Chemistry and Biochemistry. Taught as needed. (3) **Staff**

**207. Laboratory Methods in Foods Research.** Application of the experimental method to advanced problems in food research. Prerequisites: FN 109, Organic Chemistry. Taught as needed. Credit arranged. **Staff**

**230. Human Nutrition.** Metabolism of carbohydrates and minerals as applied to nutritional requirements and food supplies of people. Prerequisites: FN 140 or 143 and Biochemistry. (3F) **Hendricks**

**231. Human Nutrition.** Metabolism of lipids and proteins as applied to nutritional requirements and food supplies of people. Prerequisites: FN 140 or 143 and Biochemistry. (3W) **Wilcox**

**232. Human Nutrition.** Metabolism of vitamins; critical analyses of methods used in assessing human nutrition status; evaluation of nutritional problems of current interest. Prerequisites: FN 140 or 143 and Biochemistry. (3Sp) **Hendricks**

**233. Readings in Foods.** A critical review of scientific literature in the field of foods. Prerequisite: FN 109. Taught as needed. (3) **Staff**

**243. Nutrition and Growth.** Relation of nutrition to growth from the prenatal period to old age. Prerequisite: FN 140 or 143. Taught as needed. (3) **Staff**

**275. Problems in Institutional Administration.** Directed study on selected problems in quantity foods or institutional management for graduate students. Taught as needed. Credit arranged. (Su) **Wheeler**

**290. Independent Study.** Credit arranged. (F, W, Sp, Su) **Staff**

**291. Graduate Seminar.** Reports and discussions on current literature. (1F, W, Sp) **Staff**

**293. Research Methods.** See Family Life 293. (3W) **Compton**

**295. Research and Thesis.** Credit arranged. (F, W, Sp, Su) **Staff**

**\*\*Taught 1969-70**

Department of

## Homemaking Education

**Head:** Assistant Professor Virginia H. Harder

Office in Family Life 318

**Instructor** Gwen Biddulph.**Degrees:** Bachelor of Science (BS), Master of Science (MS)**Major:** Homemaking Education Composite for Secondary School Teaching

Homemaking Education provides professional training for teaching homemaking in the secondary schools or for Extension work.

Twelve additional subject credits are required. These electives are to be distributed between any two of the four departments.

## Undergraduate Study

Composite Major for  
Secondary School Teaching

The composite major requirements include 81 credits of subject matter courses. The courses are distributed as follows:

Course		Credits
CT	10 Pattern Designing and Clothing Construction .....	3
CT	24 Introduction to Textiles .....	3
CT	75 Home Furnishings .....	3
CT	105 Clothing Selection and Consumption .....	2
CT	106 Behavioral Science Aspects of Clothing .....	2
CT	120 Comparative Construction Techniques .....	5
FCD	67 Early Childhood .....	5
FCD	109 Play-School Education .....	5
FCD	120 Marriage .....	3
	Plus three credits elective.	
<sup>1</sup> FN	22 Principles of Nutrition .....	3
<sup>1</sup> FN	23 Principles of Food Preparation .....	3
FN	25 Meal Management for Families .....	3
FN	107 Science in Relation to Food Preparation .....	3
FN	108 Science in Relation to Food Preparation .....	3
FN	140 Nutrition .....	4
HEM	65 Housing .....	3
HEM	100 Household Equipment .....	3
HEM	149 Home Management .....	3
HEM	150 Home Management House .....	4
HEM	155 Family Finance .....	3
HEM	175 Consumer Education .....	3
PubH	152 Family Health .....	3

Course		Credits
CT	5 Design in Everyday Living .....	3
or		
FA	5 Beginning Design .....	3
Chem	10, 11 General Chemistry .....	10
Chem	12 Elementary Organic Chemistry .....	5
Physiol	4 Human Physiology .....	5
Psy	53 Elementary General Psychology .....	5

Students may gain depth in department areas by electing classes beyond the requirements.

It is recommended that a subject interest be developed into a teaching minor: e.g. English, Business, Music, Physical Education, Social Science, Chemistry, Journalism, and so on.

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.

**State Certification.** Thirty-three credits in professional education are needed to meet requirements for the General Secondary Certificate: Family and Child Development 100 or Psychology 100; Psychology 106, Public Health 155;

<sup>1</sup>May be exempt by examination.

Education 126 and 150; Homemaking Education 120, 121, 122, and 124.

Services available to teachers are:

1) Guidance and help in meeting requirements for: a) renewing certificates and b) meeting certification requirements.

2) Advanced study leading to the Master of Science degree in Homemaking Education.

3) In-service education.

**Extension Service Curriculum.** Courses required for entering the USU Extension Service as an Extension Home Economist are as outlined in the Homemaking Education Curriculum. Other recommended courses are: Extension Methods 151; Journalism 12 or 112; Speech 21; and Sociology 141. A three-month supervised training period in a county is advised for prospective Extension Home Economists. Plans for this training are made with the Director of Extension Services.

## Graduate Study

The department offers three programs for the Master of Science degree:

**Plan I.** This program is designed especially for those who wish to supervise the student teaching experience or take other home economics supervisory positions. The basic plan requires 45 credits. Research and thesis or Plan B reports may be conducted during the school year in on-going classroom situations. Evidence of a minimum of two years of successful teaching on the secondary level must be presented before the degree is granted.

**Plan II.** This program is designed for either the recent graduate in home economics or for the experienced teacher. Emphasis is

given to acquiring some depth in subject matter, curriculum development, and instructional techniques.

**Plan III.** This program is flexible to meet individual needs and is particularly applicable for extension home economists who need community development emphasis, as well as subject matter strength. The basic program requires 45 credit hours. Included is research and thesis or Plan B reports.

The department will supervise a 55 hour planned program which requires a minimum of 12 quarter hours in professional education (which may include educational psychology), and 12 quarter hours in subject matter. This program culminates in a professional certificate. The professional certificate requires evidence of no less than three years of successful teaching experience, and is issued on recommendation of the department to the state certification agency.

See the Graduate Catalog for a more detailed accounting of the three plans.

## Homemaking Education Courses

**120. Methods in Teaching Homemaking.** Guiding pupil development in basic classroom procedures. Curriculum planning with appropriate use of text books, audio-visual materials, home experience and practices, and evaluative materials. Classroom management and responsibilities. Development of a philosophy of homemaking education in keeping with changing conditions affecting family living. Prerequisite or parallel: Psychology 106. (3F, Sp) **Harder, Biddulph**

**121. Problems in Teaching Homemaking.** Opportunity to structure Homemaking units for off-campus classroom teaching in 122. Visual aids are developed; demonstrations, projects, and related activities are planned. This course is taken with Homemaking Education 122. It is important that students register with the instructor of Homemaking Education 121 and 122 one quarter prior to student teaching. This provides the time necessary to arrange teaching assignments with cooperating schools. (4F, W, Sp) **Harder**

**122. Student Teaching in Homemaking Education.** Observation and teaching of homemaking under supervision in public schools having cooperative arrangements with this University. Student teacher leaves campus the middle five or six weeks of the quarter and teaches a full homemaking program each day in an approved school. Prerequisites: Homemaking Education 120, 121. (9F, W, Sp) **Staff**

**123. Demonstration Techniques.** Purpose and techniques of demonstrations with application to Family Life teaching in schools, extension and business. Field trips to nearby areas may be planned. Taught as needed. 2 credits. **Snow**

**124. Curriculum Problems.** Independent or group study of problems developed in terms of curriculum units for student teaching assignments and within the scope and sequence of the Utah State Curriculum Guide for Homemaking. (2F, W, Sp) **Biddulph**

**190. Independent Study.** Credit arranged. (F, W, Sp, Su) **Staff**

**197. Honors Studies.** See Family Life 197. Credit arranged. (F, W, Sp, Su) **Staff**

**198. Honors Seminar.** See Family Life 198. (2W) **Staff**

**217. Current Developments in Homemaking Education.** Newer developments in homemaking education at the secondary level. Offered as needed. (3) **Harder**

**237. Seminar.** Opportunity for investigations and reporting on individual problems. Credit arranged. (F, W, Sp, Su) **Staff**

**290. Independent Study.** Credit arranged. (F, W, Sp, Su) **Staff**

**293. Research Method.** See Family Life 293. (3W) **Compton**

**295. Research for Master's Thesis.** Credit arranged. (F, W, Sp, Su) **Staff**

## Department of

# Household Economics and Management

**Head:** Associate Professor Edith Nyman  
Office in Family Life 314

**Associate Professor** Rhea H. Gardner

**Degrees:** Bachelor of Science (BS), Master of Science (MS)

**Majors:** Home Management and Family Economics, Housing and Equipment

Courses in this Department help students to understand the theory of management and decision-making in terms of personal values and goals. Theory is applied to specific aspects of management in the home: housing, family finance, and selection of household equipment. Course content gives meaning to the relationship between general economic conditions and economic problems of families.

sultants to welfare workers, and Extension Service.

## Required courses:

Course		Credits
HEM 65	Housing .....	3
HEM 100	Household Equipment .....	3
HEM 149	Home Management .....	3
HEM 155	Family Finance .....	3
HEM 175	Consumer Problems .....	3

Plus an additional 20 credits selected from the following courses and approved by the adviser.

## Family Finance Emphasis

Course		Credits
BA 63	Salesmanship .....	2
BA 140	Insurance .....	3
BA 141	Real Estate .....	3
BA 151	Marketing Principles .....	5
BA 156	Principles of Advertising .....	5
BA 161	Principles and Problems in Retailing .....	5

## Undergraduate Study

### Home Management and Family Economics Major

The major in this area prepares for professional opportunities in family financial counseling, con-



Econ 51	General Economics .....	5
Econ 52	Economic Problems .....	5
Econ 127	Social Security .....	3
Econ 165	Money and Banking .....	5

—or—

**Home Management Emphasis**

Course		Credits
Psy 53	Elementary General Psychology .....	5
Psy 161	Social Psychology .....	3
Psy 172	Motivation .....	3
SW 50	Social Welfare Agencies .....	3
Anthro 90	Introduction to Cultural Anthropology .....	5
Anthro 105	Comparative Value System and Education .....	3
Phil 45	Introduction to Problems of Philosophy .....	5
Phil 50	Beginning Logic .....	5
Mfg Eng 137	Work Simplicity and Layout .....	4
Soc 158	Human Relations in Industry .....	3
HEM 110	Advanced Equipment .....	3
HEM 165	Advanced Housing .....	3
HEM 150	Home Management House .....	4
FCD 67	Early Childhood .....	3
FCD 100	Human Growth and Development .....	3
FCD 120	Marriage .....	3

**Housing and Equipment**

This major prepares students for professional opportunities in city planning; with housing agencies and home building industries; as consultants in kitchen planning, remodeling, home lighting, and interior design, and for home service work with utility companies.

Required courses:

Course		Credits
HEM 65	Housing .....	3
HEM 165	Advanced Housing .....	3
HEM 100	Equipment .....	3
HEM 175	Consumer Education .....	3
HEM 149	Home Management .....	3
ITE 79	Practical Electrical Wiring .....	3
LAEP 20	Graphics .....	3

Plus an additional 24 credits in Housing or 29 credits in Equipment.

**Housing Emphasis**

Course		Credits
HEM 155	Family Finance .....	3
CT 75	Home Furnishings .....	3
Journ 13	Reporting .....	3
LAEP 3	Elements of Land Planning and Design .....	3
Art 85	Beginning Arch Rendering .....	3
Art 40	Essentials in Interior Design..	3
Art 140	Applied Interior Design .....	3
Psy 161	Social Psychology .....	3

Arrangement should be made with the adviser for a suggested minor in one of these areas: Art, Psychology, Sociology, Landscape Architecture and Environmental Planning, or Interior Design.

—or—

**Equipment Emphasis**

Course		Credits
HEM 110	Advanced Equipment .....	3
HEM 120	Utility Company Internship ....	9
HEM 150	Home Management House .....	4
or 151		
HMed 123 or 151	Demonstration Tech ....	2
Journ 13	Reporting .....	3
Speech 105	Technical and Professional Speaking .....	3
Physics 6	General Physics .....	5

Arrangement should be made with adviser for a suggested minor in one of these areas: Foods and Nutrition, Radio and TV, or Business.

**Homemaking Education with a Housing and Equipment Business Major**

A major in these two areas prepares students for teaching junior and senior high school Home Economics, or for positions with gas and electric utility companies as demonstrators or home service consultants. This combination also leads to business opportunities in the fields of home planning and design, and with appliance manufacturers.

The requirements for a major in Homemaking Education are listed under that area. See Page 229.

The requirements for this combination over and above those for the Homemaking Education major are:

Course		Credits
HEM 120	Utility Company Internship ....	9
HMed 123	Demonstration Techniques ....	2
Journ 13	Reporting .....	3

**Equipment Emphasis**

Physics 6	General Physics .....	5
ITE 79	Practical Electrical Wiring ...	3

—or—

## Housing Emphasis

Course		Credits
Psy 161	Social Psychology .....	3
LAEP 20	Graphics .....	3
Art 85	Beginning Architecture .....	
	Rendering .....	3

The following courses may be selected as group fillers and electives:

HEM 165	Advanced Housing .....	3
HEM 110	Advanced Equipment .....	3
LAEP 3	Elements of Land Planning and Design .....	3
Econ 51	General Economics .....	5
Speech 105	Technical and Professional Speech .....	3

## Minor

HEM 65	Housing .....	3
HEM 100	Household Equipment .....	3
HEM 149	Home Management .....	3
HEM 155	Family Finance .....	3

Plus an additional six credits in the Department or related supporting courses approved by the Department Head.

## Graduate Study

The Department of Household Economics and Management offers work leading to the Master of Science degree, with emphasis on Housing, Household Equipment, Home Management, or Family Finance. Flexibility in program planning provides opportunity for developing individual abilities and interests. Course work is arranged in cooperation with other departments of the University, including: Economics, Sociology, Psychology, Philosophy, Business Administration, Physics, Statistics, Chemistry, Family and Child Development, Food and Nutrition, and Clothing and Textiles. A Master's degree prepares students for University teaching.

## Household Economics and Management Courses

**65. Housing.** A consideration of factors involved in housing the family; renting or buy-

ing, building or buying, location, orientation and site planning; financing, criteria for evaluating homes; housing trends; population increase. (3F, W, Sp) **Staff**

**100. Household Equipment.** Principles of selection, use, care, and arrangement of kitchen and laundry equipment. (3F, W, Sp) **Staff**

**110. Advanced Equipment.** Special Problems in performance testing of major appliances and small pieces of equipment now on the market. (3W, Sp) **Staff**

**120. Utility Company Internship.** Practical experience with a utility company under the direction of a supervisor from the utility company and the University. Students will be employed for a 40-hour week out of the Salt Lake City office during the second five-week period of the quarter. May be blocked with HEM 150 and/or Independent Study. Students must be approved by the instructor and the utility company representative before registration. Prerequisites: HEM 65, 100, 150, and Foods 25. (9F, W, Sp) **Staff**

**149. Home Management.** The theory of effective home management; values and goals reflected in decision-making on family resources. (3F, W, Sp) **Nyman**

**150. Home Management House.** The application of the theory of management in a living situation. Residence in a Home Management House provided for a five-week period. Application must be made with instructor in advance of registration. Students who are employed must check their working schedule with the faculty adviser before planning to move into the House. Prerequisites: Food and Nutrition 22, 23, 25 or its equivalent; Household Economics and Management 149. (4F, W, Sp) **Staff**

**151. Home Management Problems.** Substitute for HEM 150 for married students only. The application of the theory of management as applied in students' homes. Prerequisites: Foods and Nutrition 22, 23, 25 or equivalent; Household Economics and Management 149. (4F) **Nyman**

**155. Family Finance.** Consideration of major financial alternatives available to families; some factors that determine financial decisions. (3F, W, Sp) **Nyman**

**160. Seminar.** Reports and discussion of current readings in Household Economics and Management. (2Sp) **Staff**

**165. Advanced Housing.** Organization and use of space in various types of dwelling units, house design and remodeling for different family stages. (3F, Sp) **Staff**

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**175. Consumer Education.** The role of the family and its members as consumers; current aspects of consumer behavior; agents involved, i.e. government, the market, consumer interest groups, etc. (3W, Sp) **Nyman**

**190. Independent Study.** For qualified students upon consultation with the instructor. Credit arranged. (F, W, Sp, Su) **Staff**

**197. Honors Studies.** See Family Life 197. Credit arranged. (F, W, Sp, Su) **Staff**

**198. Honors Seminar.** See Family Life 198. (2W) **Staff**

**249. History and Philosophy of Home Management.** History and development of Home Man-

agement as a field of study from the early years of Home Economics to the current time. (3F) **Nyman**

**260. Graduate Seminar.** Review of current literature in Household Economics and Management. (2W) **Staff**

**290. Independent Study.** For qualified students upon consultation with the instructor. Credit arranged. (F, W, Sp, Su) **Staff**

**293. Research Methods.** See Family Life 293. (3W) **Compton**

**295. Research for Master's Thesis.** Credit arranged. (F, W, Sp, Su) **Staff**

### General Major in

## Family Life

**Coordinator:** Dean Phyllis Snow

**Adviser:** Any staff member in any department in Family Life.

This program is designed for the student wishing general education for family living plus a broad cultural education. Also, the curriculum is basic to positions for which a general background is required, such as journalism, international service, or participation in government agency programs

like Vista, Peace Corps, and Public Welfare.

Fifty credits, taken in at least three departments, are required for the major. The minor should be selected to complement the major.

As soon as possible after choosing this major the student should plan with the adviser.



Combination Major in

## Family Life and Office Administration

This is a program for women who desire basic education for Family Life plus sufficient secretarial training to provide for employment opportunities outside the home. For a Bachelor's degree with this combination major, students complete the Family Life and Secretarial courses here listed, plus the University group requirements listed in the Catalog.

### Family Life Courses

42 credits with not less than 9 in any department.

#### CLOTHING AND TEXTILES

Course	Credits
CT 10 Pattern Designing and Clothing Construction .....	3
CT 24 Introduction to Textiles .....	3
CT 75 Home Furnishings .....	3
CT 105 Clothing Selection and Consumption .....	2
CT 106 Behavioral Science Aspects of Clothing .....	2
CT 120 Comparative Construction Techniques .....	5
CT 135 History of Textiles and Costume .....	3
CT 140 Draping .....	3
CT 170 Flat Pattern Designing .....	3
CT 180 Tailoring .....	3

#### FAMILY AND CHILD DEVELOPMENT

Course	Credits
FCD 20 Marriage and the American Family .....	3
FCD 67 Early Childhood .....	5
FCD 77 Child from 6-12 .....	3
FCD 100 Human Growth and Development .....	3
FCD 108 Guidance of the Young Child .....	3
FCD 115 Growth of the Infant .....	3
FCD 120 Marriage .....	3
FCD 135 Early Childhood and Deprivation .....	3
FCD 140 The Family in its Social Setting .....	3
FCD 150 Seminar .....	2
FCD 185 Family in Middle and Later Years .....	3

#### FOOD AND NUTRITION

Course	Credits
FN 22 Principles of Nutrition .....	3
FN 23 Principles of Food Preparation ..	3
FN 25 Meal Management for the Family .....	3
FN 107 Science in Relation to Food Preparation .....	3
FN 108 Science in Relation to Food Preparation .....	3
FN 109 Experimental Foods .....	3
FN 135 Weight Control .....	3
FN 140 Nutrition .....	4
FN 146 Food Processing in Relation to Consumer Use .....	2
FN 147 Food Economics .....	2
FN 150 Seminar .....	1

#### HOUSEHOLD ECONOMICS AND MANAGEMENT

Course	Credits
HEM 65 Housing .....	3
HEM 100 Household Equipment .....	3
HEM 110 Advanced Equipment .....	3
HEM 149 Home Management .....	3
HEM 150 Home Management House .....	4
or	
HEM 151 Home Management Problems .....	4
HEM 155 Family Finances .....	3
HEM 160 Seminar .....	3
HEM 165 Advanced Housing .....	3
HEM 175 Consumer Education .....	3

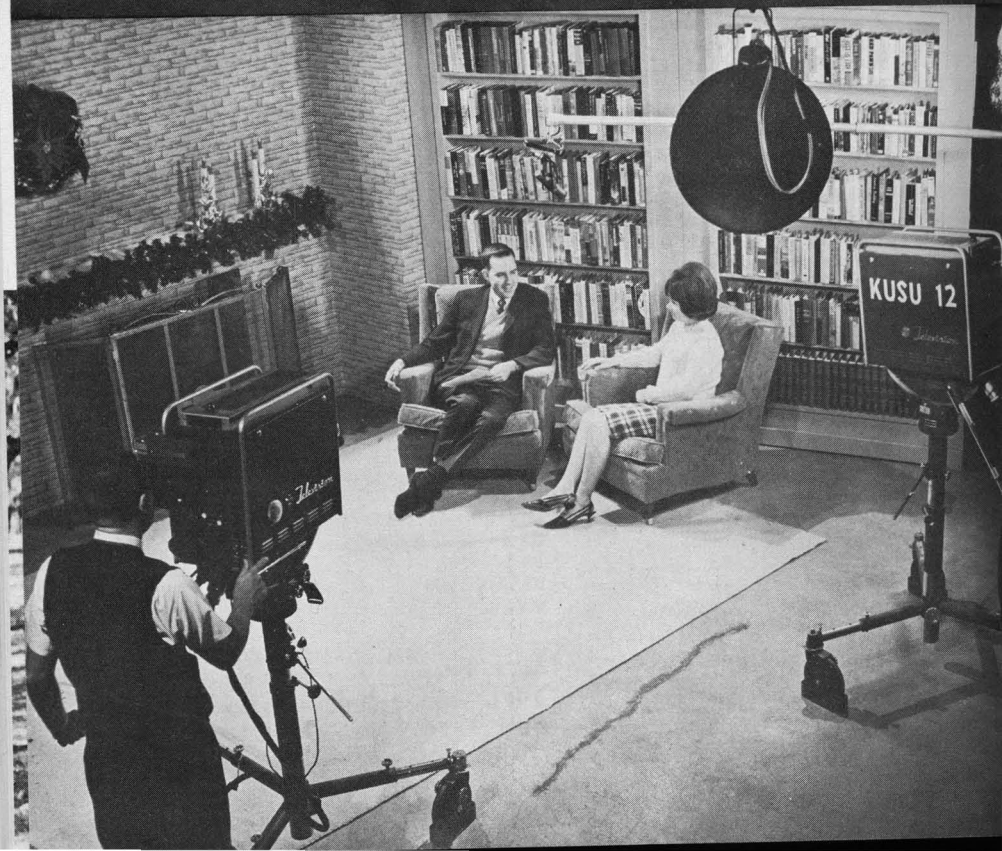
### Office Administration Courses

Course	Credits
OA 42 Intermediate Type .....	2
OA 43 Advanced Type .....	2
OA 65 Records Administration .....	3
OA 85 Office Data Systems .....	3
OA 92 Business Machines .....	2
OA 141 Dictation and Transcription I ..	5
OA 142 Dictation and Transcription II ..	5
OA 167 Office Practice .....	2
OA 175 Office Management .....	3
OA 186 Secretarial Procedures .....	3
<sup>1</sup> Acct 1 Introduction to Accounting .....	3
BA 4 Business Law .....	2
BA 5 Business Law .....	2
BA 20 Introduction to Business .....	3
BA 143 Business Communications .....	3

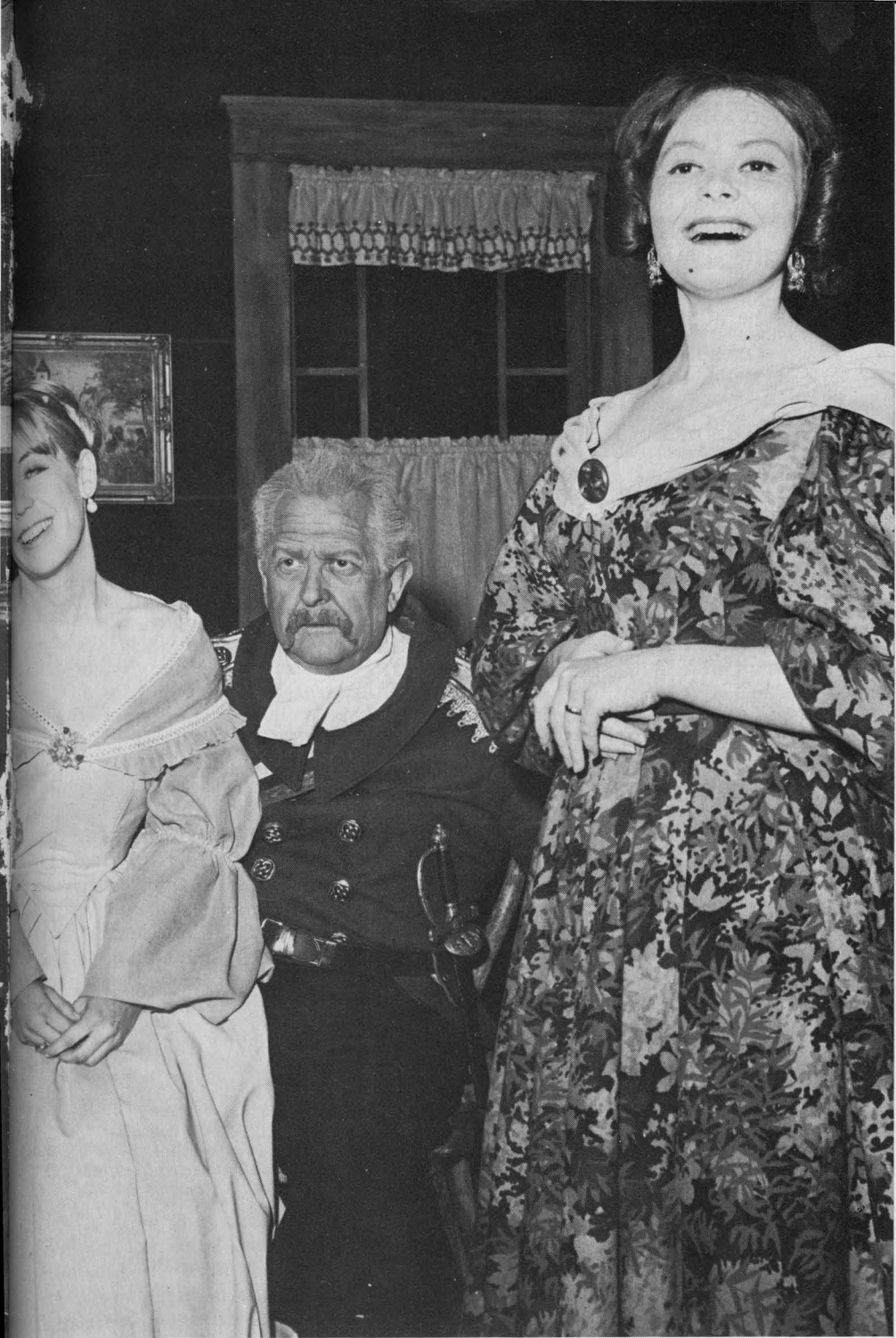
Total Credits ..... 43

<sup>1</sup>It is recommended that Acct 2 also be completed—3 credits.









*COLLEGE OF HUMANITIES AND ARTS*

College of

## Humanities and Arts

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Degrees Offered:

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Bachelor of Fine Arts

Bachelor of Landscape Architecture

Bachelor of Music

Bachelor of Science

Master of Arts

Master of Fine Arts

Master of Landscape Architecture

Master of Music

Master of Science

## College of

# Humanities and Arts

Carlton Culmsee, Dean

Marlan D. Nelson, Assistant to the Dean

Office in Library 229

**Scope of College of Humanities and Arts.** Besides providing basic preparation courses for students who will graduate from other divisions of the institution, the College of Humanities and Arts assists all students in the University toward a liberal education. The need to understand our own culture and the culture of other nations has never been so urgent as now, and for this understanding, languages, philosophy, literature, and the arts are essential. These are the means by which individuals and peoples speak to each other, whether in an individual conversation, a public address, a television documentary, a story, a painting, a statue, a musical work. To know the work of Aeschylus, Plato, and Praxiteles is essential if we would know Greece, for example, and understand the significant parts of our culture which we have inherited from her.

The curricula of the College also enable a student to prepare for a career with a major in any of several departments.

Those interested in a broad education rather than a specific career preparation may take a degree in Liberal Arts. Sufficient concentration in languages, literature, history, or one of the sciences is required to provide sound preparation for graduate work, but emphasis is on a good introduction to several areas.

General principles which may help guide Humanities and Arts students and their advisers in fashioning study programs are these: A student should seek a true liberal education including both the arts and the sciences. At least two years of a foreign language are advisable. Besides the major and minor areas of concentration, a student should choose as many courses as possible from those designed to aid in discerning meanings, relating significant ideas, and forming sound patterns of thought and action. These are exemplified in philosophy and other courses which seek to emphasize central, unifying principles.

## Liberal Arts

Marlan D. Nelson, Adviser

Office in Library 235

The Liberal Arts program provides a course of study combining elements of both the humanities and the sciences and leading to a degree in Liberal Arts. Considerable flexibility is afforded through choice among several cur-

ricula. The goal is substantial, orderly, well-balanced mental development of a broad type. Eventual selection of a field of concentration in the general area of either the sciences or the humanities is required for a degree.

**Curricula in Liberal Arts**

The following three courses of study, each leading to a Bachelor's degree, are available in Liberal Arts. Students are not required to complete a separate minor. Because of the requirements for basic courses in several fields, upper division requirements for graduation may be reduced to a minimum of 50 credits.

**I) Main Currents in Western Civilization.** Two years of a foreign language; a concentration of 40 credits in either history or literature and 15 credits in the one not chosen for concentration; 14 credits in Philosophy;<sup>1</sup> 15 credits in one of the sciences or in mathematics.

A) Literature. 1) For concentration: English 40, 41, 147, 148, 149; and 15 credits selected from English 142, 150, 151, 152, 190, 191 and classes in the literature of a foreign language. 2) For the 15 credit requirement for those concentrating in history: any 15 credits from the above courses.

B) History. 1) For concentration: History 4, 5; and 30 credits in History, chiefly upper division, chosen in consultation with a member of the History faculty. 2) For the 15-credit requirement for those concentrating in literature: History 4, 5, 20.

C) Philosophy. Fourteen credits from the following: Philosophy 45, 50, 140, 141, 142, 160, 161; Political Science 145, 146, 147.

D) Mathematics and Science. Complete one of the following series: 1) Biological Science: Biology 15 or Bacteriology 10; Zoology 31 and 107; Public Health 50. 2) Chemistry: Chemistry 20-21-22 or 10-11-12. 3) Mathematics: Mathematics 35, 46, 96. 4) Phys-

ics: Physics 17-18-19, or 20-21-22. If students select the series in Physics, they should fill the exact science group requirement with Mathematics 35 and 46, and are advised to complete Mathematics 96 also.

**II) Languages and World Literature.** Thirty-nine credits in foreign languages; 40 credits in Literature; 30 credits in Philosophy.

A) Languages: Two years in one foreign language; one year in a second foreign language.

B) Literature (40 credits): 1) At least 25 credits selected from English 40, 41, 140, 141, 142, 147, 148, 149, 168, 169. 2) At least nine credits in the literature of one or more foreign languages.

C) Philosophy: Philosophy 45, 50, 140, 141, 142, 160; History 4, 5; any two (six credits) of Political Science 145, 146, 147.

**III) Science and Philosophy.** Two years of a foreign language; a concentration in either Mathematics and Physical Science or in Biological Sciences as specified below; 30 credits in History, Philosophy, and Literature.

A) Science: Complete one of the following programs: 1) Physical Science and Mathematics:<sup>2</sup> Mathematics 35, 46, 96, 97, 98, 99, and either (a) or (b). a) Chemistry 20-21-22 or 10-11-12; Physics 17-18-19, or 20-21-22; 153-154-155, or 175-176-177. b) Physics 17-18-19, or 20-21-22; Chemistry 20-21-22, or 10-11-12; 104-105-106, or 121-122-123, or 134.

2) Biological Sciences.<sup>2</sup> Biology 15, Zoology 16, 107, 112, and 132; Botany 26, 102, 104; Bacteriology 70, 160; Public Health 50, 155; Physiology 104. Students selecting this series should fill the Physical Science group requirements with classes in Chemistry or Physics.

<sup>1</sup>See Philosophy Division of Department of Languages and Philosophy. Political Science 145, 146 and 147 deal with political philosophies and are therefore relevant.

<sup>2</sup>Ten of these credits may be applied toward the group requirement in the field.

A) History, Literature, Philosophy. Thirty credits from among the following, shared among at least three departments: English, American or Comparative Literature or

the literature of a foreign language; Philosophy 45, 50, 140, 141, 142, 160; History; Political Science 145, 146, 147; Sociology 70; Economics 51, 52.

## Liberal Studies

Marlan D. Nelson, **Coordinator**  
Office in Library 235

The chief function of the Liberal Studies program is the advisement of students who have not decided upon a major subject or area of specialization. The Liberal Studies Coordinator finds a suitable adviser for each of these students. With the aid of this adviser he looks after the student's academic interests, encouraging him to pursue a general Liberal Studies program while he explores his own aptitudes and various career op-

portunities so that he can choose a major field. Advisers are selected from all colleges of the University on the basis of personality qualifications and student interests.

Students who are enrolled in another department but believe that they have chosen their major unwisely may transfer to the Liberal Studies program upon receiving permission from the Dean of the College of Humanities and Arts.

## Department of

## Art

**Head:** Associate Professor Harrison T. Groutage  
Office in University Annex 205A

**Professors** Jessie Larson, Everett C. Thorpe; **Professor Emeritus** H. Reuben Reynolds; **Associate Professors** Larry Elsner, Arlen Hansen, Gaell Lindstrom; **Assistant Professors** Jon Anderson, Ralph T. Clark; **Instructor** Adrian Van Suchtelen.

**Degrees:** Bachelor of Arts (BA), Bachelor of Fine Arts (BFA), Master of Arts (MA), Master of Fine Arts (MFA).

**Majors:** Advertising Design, Art Education, Ceramics, Fabric Design, Interior Design, Jewelry and Metalsmithing, Painting and Drawing, Photography, Printmaking, Sculpture, Illustration.

Utah State University offers an unusually wide and varied program in the visual arts.

Its general education classes help all students increase their employment of the world of sights. Its professional courses prepare students for various artistic fields.

Following their completion of

the basic design classes, visual arts students may specialize in any of eight areas: Painting and Drawing, Advertising Design and Illustration, Sculpture, Graphics, Interior Design, Photography, Crafts, and Art Education. Bachelor's and master's degrees may be earned by students demonstrating



sufficient talent and application. Work in ceramics, fabric design, printmaking, jewelry, and metal-smithing suggests the enrichment beyond the more traditional university art programs.

The department requires exhibits of work by student majors, and regularly sponsors exhibits by staff and outside artists. It promotes appreciation of visual art on the campus also by creating murals, pictures, sculpture, and other achievements in art for campus buildings and by supervising acquisition and placement of the University's permanent art collection.

**General Education Requirements.** A general education in the visual arts is of lasting value to university students. Several courses are offered which satisfy the Humanities and Arts group requirements: Art 1, 10, 35, 36, 37, 38 and 40.

### **Undergraduate Study Bachelor of Arts Degree**

It is strongly recommended that Art majors complete all general education group requirements and the modern language requirement by the end of the Sophomore year. This will allow students to work intensively in their studio art courses during the Junior and Senior years. They must satisfactorily complete the core of basic art courses: Art 1, 5, 6, 7, 8, 12, 13, 14, 35, 36, 37 and 10 or 38 with at least a grade of "C" or better. The design courses Art 5, 6, and 7 and drawing and painting courses Art 8, 12, 13 and 14 are fundamental prerequisites and should be completed before registering for other studio classes.

Art majors may specialize in any one of the following areas: Painting and Drawing, Advertising Design, Illustration, Sculpture, Fab-

ric Design, Ceramics, Jewelry and Metalsmithing, Printmaking, Interior Design, Photography, or Art Education, which includes some work in all of these areas. With the permission of the major adviser and the head of the department, it is also possible to undertake a composite major program. The detailed outline of course requirements for each of these specializations is available at the Art Department office. The major professor may also prescribe other courses to serve the particular needs of different students.

The quality, as well as the quantity, of student art work is of great importance. Students must demonstrate their competence in original, creative expression. In the area of specialization, any upper division course may be repeated for additional credit in order to more fully develop student abilities.

During the final quarter, before graduation, each student will participate in a Senior Exhibition. The best works created during the Junior and Senior years should be retained for this important exhibition. These may include paintings, drawings, sculpture, crafts, commercial designs, etc. They should be well framed or displayed in such a manner that a student's understanding of quality work and well-designed presentation are evident.

Utah State University Department of Art Faculty reserve the right to retain any student works of their choice for purpose of display and exhibition.

### **Bachelor of Fine Arts Degree**

This is a professional art degree requiring above average accomplishment in art, intensive application and the consistent production of creative works of high quality. There is no modern language re-

quirement. General education requirements must be completed in the Freshman and Sophomore years in order that students can devote their Junior and Senior years to intensive work in studio art courses in the areas of their specialization.

Instead of the usual major and minor requirements, students for this degree are required to satisfactorily complete a composite Art major in closely related art areas. This is a highly individualized program of study, and major advisers will establish the specific requirements of greatest value to each individual student. The basic art courses, Art 1, 5, 6, 7, 8, 12, 13, 14, 35, 36, 37 and 10 or 38 must be completed with at least a "B" average. Design courses Art 5, 6, and 7 and Painting and Drawing courses 8, 12, 13 and 14 should be completed before registering for other studio courses.

Only students demonstrating considerable promise will be accepted for this more demanding professional degree. Transferring students must submit a portfolio and demonstrate the same level of proficiency as Utah State University undergraduates in Art.

All BFA students are also required to participate in a Senior Seminar Exhibit during the final quarter before graduation.

### Art Minor Requirements Advertising Design Major

The requirements for a minor in Art are flexible and can be completed in any area of specialization. Generally, the minimum requirements include: Art 1, 5, 8, 14, plus three credits from the Art History group (10, 35, 36, 37, 38) and three credits from the hand crafts group (19, 30, 66).

One of the most vital areas of Art, Advertising Design, keeps constant pace with our economy. It is through the creative work of

successful designers that products are advertised and sold. Courses place heavy stress on design and layout. To prepare for a professional job in this field, one must acquire proficiency in lettering, design, rendering techniques and production methods. He also prepares a portfolio of work to show prospective employers his ability to produce tasteful and imaginative solutions to advertising problems. In addition to the basic courses, Advertising Design majors are required to take the following: Art 57, 58, 59, 81, 82, 83, 181, 182, 183, 184, 192. Additional recommended classes to be selected on consultation with advisers are: Art 9, 104, 105, 136, 137, 138, 183, 191, and 192.

### Illustration Major

As our culture moves from an oral to a visual emphasis, illustration becomes a powerful and important field. In addition to the basic courses, Illustration majors are required to take the following: Art 9, 11, 13, 82, 83, 104, 105, 112, 183, 184, 191 and 192. Additional recommended classes to be selected after consulting with advisers include these: Art 57, 58, 81, 84, 111, 127, 182, and 195.

### Art Education Major

To teach Art in the secondary schools, students should major in Art Education. Prospective teachers are encouraged to acquire an extensive background in several Art areas. Their own creative work should demonstrate better than average ability. Broad understanding and creative production are great assets to the art teacher who wants to be a motivating example to his students and to be sensitive to different student possibilities. In addition to the basic courses, Art Education majors are required to take the following

classes: Art 9, 11, 19, 30, 60, 81, 82, 104, 111, 115 or 116, 127, 152, 191, 192 plus additional classes prescribed by the adviser.

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.

Minimum requirements for an Art minor for students majoring in **Elementary Education**: Art 1, 5, 6, 7, 8, 12, 14, 50 and 151.

### **Ceramics Major**

Ceramics is the third largest industry in America today. The study of Ceramics includes pottery, tile, terra cotta sculpture, brick making, etc. and is used in the forming of many porcelain parts in technical and electronic equipment. Ceramic crafts as taught at USU are rapidly becoming an important part of artistic training recognized by both the artist and industry. The University has one of the most complete and well-equipped ceramic workshops in the nation. Excellent tools and equipment are provided for each student. The lab is accessible during the day for classes and special work and two evenings per week. Special high-fire kilns are available for student work as well as a variety of clays and glazes. Programs in this area are tailored to fit needs of an individual student, both beginning and advanced. In addition to the basic courses Ceramic majors are required to take: Art 19, 30, 31, 60, 119, 130, 131, 132, 160, plus additional classes to be prescribed by the major professor.

### **Fabric Design Major**

Through the ages man has employed fabrics for dual purposes of

utility and esthetic expression. In today's living, fabrics are achieving an increasing importance and their traditional uses in personal adornment and home furnishing are expanding. Fabrics have become essential units in contemporary architectural and industrial design. New commercial products constantly suggest new areas of interest for the weaver and fabric designer. Students develop creative fabric design projects which include experimentation with new fibers and techniques of enrichment, both applied and structural, and give fresh and original application of known and satisfactorily proven techniques. In addition to the basic courses, Fabric Design majors are required to complete the following: Art 40, 66, 107, 115, 116, 117, 166, 169 and Clothing and Textiles 24. Additional prescribed classes are to be selected on consultation with their adviser.

### **Interior Design Major**

Never before has there been such widespread interest in home planning nor such varied materials from which to choose. Interior Design courses are planned to help those who wish to make their own home appropriate to their kind of family life as well as to prepare adequately those who wish to enter the Interior Design field professionally. In addition to the basic courses, Interior Design majors are required to take the following: Art 11, 40, 66, 81, 115, 116, 140, 142, 143, 144, and Clothing and Textiles 24. Additional prescribed classes to be selected on consultation with advisers are: Art 19, 30, 60, 81, 127, 166, 169, 191, 192, Landscape Architecture 3; Plant Science 118; Household Economics and Management 65; Industrial and Technical Education 164.

### **Jewelry and Metalsmithing Major**

Various metals provide exciting possibilities for the creative artist. For centuries molten metal has been used to cast jewelry. Sheet metal can be formed by hammering into exciting functional and aesthetic forms. Welding techniques can be used to create art of three dimensional design. There are unlimited possibilities for artistic design in creation of modern jewelry. In addition to the basic courses, Jewelry and Metalsmithing majors are required to take: Art 19, 60, 104, 105, 30, 31, 119, 120, 121, 13, 160, plus additional classes according to the individual needs as prescribed by the major professor.

### **Painting and Drawing Major**

When most people think of art, it is painting and drawing that they generally have in mind. Contemporary artists are utilizing all of the historical approaches to painting and drawing and are exploring new ideas, techniques, and materials in order to make new contributions. A student is not required to follow any one approach to drawing or painting, but his own individuality is encouraged. In addition to the basic courses, he is required to take Art 9, 11, 60, 104, 105, 106, 109, 111, 112, 113, 127, 192, 195. Additional classes prescribed are Art 30, 40.

### **Photography Major**

Photography is one of the most recent fine art forms. National and international exhibits of photographs in color and black and white have aroused great interest. There are many opportunities for photographers in the commercial world of advertising and illustration, industry, portraiture, medicine, and the sciences. Photography majors are re-

quired to take the basic art courses (excluding Art 12 and 13) as a basic art minimum. Photography courses should include Art 53, 54, 56, 57, 58, 59, 128, 164, 165, and 167. In order to develop professional competence, several of these upper division studio courses should be repeated for additional credit.

Students planning on operating their own photography studio as a business should take Accounting 100 and the following Business Administration classes: 133 Management Concepts, 147 Managing Small Business, 151 Marketing Principles, 156 Principles of Advertising and 160 Sales Management. Social Psychology 161, Sociology 70 and Landscape Architecture 3 are also recommended for all Photography majors.

The required Senior Exhibition will display the best black and white and color photography prints in a well-designed show given during the final quarter before graduation in conjunction with other art students.

### **Printmaking Major**

Printmaking is enjoying a powerful renaissance in America at present. Prints are competing with other art forms as they never have before and they give artists and collectors advantages that other art forms do not. Printmaking is perhaps man's most interesting art in that it encompasses so many of the other art activities. To make a fine print a student must draw, design, carve, and print. In addition to the basic courses, Printmaking majors are required to take: Art 9, 104, 105, 111, 112, 191, 193, 194, 195 plus additional courses prescribed by major professor.



**Sculpture Major**

Sculpture is one of the oldest forms of artistic expression and the contemporary sculptor is still utilizing the ancient materials of wood, stone, clay and metal but with new insights. New materials and new techniques have broadened the range of sculptural expression. Proficiency in drawing and design are first objectives. At the same time some understanding of the structural nature of the various sculptural media is expected to be developed. In addition to the basic requirements for all Art majors, Sculpture majors are required to complete satisfactorily with a "B" average the following courses: Art 9, 19, 30, 31, 60, 104, 105, 160, plus additional courses based on individual needs as recommended by the major professor.

**Fine Arts Tours**

Art majors and minors should plan to participate in some of the excellent Fine Arts Tours available. These include the annual Fall tour to San Francisco to visit the art galleries, museums and attend operas, Broadway plays, and musicals. The annual Fine Arts Tours to Europe and Mexico are conducted during Summer Quarter. These tours are planned for a maximum learning experience and are possible at minimum cost. Up to nine University credits may be earned on these summer tours. Detailed information is available in the office of the Director of Tours.

**Graduate Study**

Challenging opportunities for graduate study and creative performance are available in many areas of the Art Department. Students may choose to qualify for either the general more liberal Master of Arts degree or the more

specialized and professional Master of Fine Arts degree.

**Master of Arts Degree.** This is the liberal studies degree in Art at the graduate level. General requirements are listed in the graduate section of the general and graduate catalogs. Required in this degree is a proficiency in one or more foreign languages to be approved by the Department of Languages. Other departmental requirements are the same as numbers 1), 2), 3), 4), 5), 6), and 7) listed below under the heading of the MFA degree.

All graduate art students are urged to plan for participation in the annual Fine Arts tours of Europe and Latin America. Annual Fall tours to San Francisco, California, to visit the galleries, museums, Broadway Plays, San Francisco Opera, and other events are required of all graduate students.

**Master of Fine Arts Degree.** This is a specialized professional degree. The College Art Association of America approves the MFA degree rather than a PhD degree as the terminal degree in the studio arts. An exceptional student devoting fulltime might qualify after four quarters in residence for the degree, but it generally requires an average of two years to satisfactorily complete this degree. The accumulation of credits and the number of quarters in residence are not major factors in the completion of this degree. However, minimum credit and resident credits must be completed. Emphasis is placed on creative, artistic and technical achievement.

The requirements include the following:

A portfolio of original work clearly showing the student's present level of accomplishment in all art areas, but more particularly in



the area of his selected specialty, should be submitted for faculty evaluation prior to registration for any Art Department course work. A written or verbal report of the evaluation will be given the student with suggested courses of study. Courses required to correct any apparent deficiencies will not be counted as graduate credit.

After acceptance to the MFA graduate program and after the completion of one quarter's work, a Graduate Committee is appointed to aid the student in further work. They assist with the main direction of his work and help in the preparation of the Thesis Statement which must be filed with the department and graduate office during the second quarter in residence.

A complete written and illustrated record of all graduate work must be kept current for inclusion in a printed thesis. Details of the nature of the thesis may be obtained from the graduate director of the Art Department.

At least one month prior to graduation the student must design a comprehensive exhibit of his graduate work and be responsible for its display. All paintings, drawings, photographs, or prints must be appropriately matted or framed. Sculpture and ceramics must be carefully displayed on suitable stands or tables or in exhibit cases. Suggestions for the exhibit will be made by the student's graduate committee, but the candidate is solely responsible for the design and display of his show which will be considered an important conclusion to his graduate work. A display area should be selected with the help of the graduate director and reserved at least three months before exhibition time. All work to be shown in the exhibit should be selected with the help of the graduate committee. Regardless

of the number of credits accumulated or courses completed, the degree will be granted only on approval of the graduate committee which will recommend the time of the student exhibit.

At the discretion of the faculty, one or more works from the master exhibit may be selected for the University Permanent Collection.

Prior to the final oral examination, an adequate selection of colored 35mm slides of the master exhibit should be presented to the committee chairman. The slides will be retained in the Art Department as a permanent record of the graduate show.

Three quarters of successful work in the graduate seminar, Art 273, are required of all MA and MFA degree candidates.

Because the MFA degree is highly individualized, the student should consult the Department for more detailed information on requirements.

## Art Courses

**1. Exploring Art.** Designed to increase enjoyment of living through the sense of sight. Develops understanding of basic principles underlying the visual forms of art in everyday life. (3F, W, Sp) **Staff**

**2. Freshman Seminar.** To aid Freshman art students Fall Quarter in University orientation and provide particular orientation within the various areas of the Art Department. Informal group discussions on special related topics of career opportunities, scholarships, etc. (Required of all Freshman Art Majors) (1F) **Staff**

**5. Beginning Design.** Introduces the basic art elements and is comprised of projects largely in two dimensions. Required of Art majors. Prerequisite to Art 14. (3F, W, Sp) **Staff**

**6. Intermediate Design.** Composition of spatial volume with points, lines, planes and color, and shapes with color and texture. Also sculptural experience with handles, stables, and mobiles. Prerequisite: Art 5. (3W) **Staff**

**7. Advanced Design.** Introduction of the potential and limitations of various creative media. Prerequisite: Art 6. (3Sp) **Staff**

**8. Basic Drawing.** An individually creative approach to drawing natural forms from observation and memory. Various media are used. Prerequisite to all painting courses. (3F, W, Sp) **Van Suchtelen**

**9. Anatomy and Design for Artists.** Analysis of structure of the body, with emphasis on surface characteristics. Prerequisite to life drawing. (3W) **Van Suchtelen**

**10. Analyzing Contemporary Painting.** There are many kinds of "modern painting" because artists are highly individual and they strive to achieve different purposes. A text and other illustrative materials are used to help understand contemporary trends in art. (3F, W, Sp) **Tippetts**

**11. Beginning Watercolor.** Experimental approaches with transparent watercolor, casein, gouache. Part of the quarter will be spent out of doors sketching directly from nature. Prerequisite: Art 8. (3F, Sp) **Lindstrom**

**12. Intermediate Drawing.** A continuation of Basic Drawing emphasizing more complex drawing problems and requiring a deeper analysis of the essentials in the subject matter. All drawing media are used. Prerequisite: Art 8. (3F, W, Sp) **Van Suchtelen**

**13. Drawing and Composition.** Intensive drawing in all media emphasizing various approaches to composition. Prerequisites: Art 8, 12. (3W, Sp) **Van Suchtelen**

**14. Introduction to Painting.** Basic approaches to painting which develop freedom of expression and experiences in various applications. Tempera and related media. Required as prerequisite to all other painting courses. Prerequisite: Art 5. (3F, W) **Thorpe**

**19. Jewelry and Metalsmithing.** The design and production of objects in nonferrous metals, using the basic techniques of metalsmithing. Emphasis on raising and fabricating metal holloware in conjunction with the various technical means to that end: sawing, filing, soldering, buffing, etc. Prerequisites: Art 5, 6, 7. (3F, W) **Staff**

**30. Introduction to Ceramics.** Beginning course in ceramics. Techniques of throwing, slab and coil building, carving, pinching. Introduction to the complete ceramic process, through the use of films, slides, and lectures. Desirable prerequisites: Art 1, 5. (3F, W, Sp) **Staff**

**31. Ceramics.** Emphasis on the use of the potter's wheel. Design and experimentation are stressed. Introduction to glazing techniques, kiln stacking and firing. Prerequisite: Art 30. (3F, W, Sp) **Lindstrom, Elsner**

**35, 36, 37. Art History.** A three-quarter sequence for Art majors. A thorough survey of the lasting contributions of each major art movement. Through use of visual aids, artists and their enduring works are discussed and observed: primitive, classical, medieval, ren-

aissance, neoclassical, the important schools of modern art, and contemporary works. (3F, 3W, 3Sp) **Staff**

**38. History of Painting in the USA.** (3F) **Lindstrom**

**40. Essentials in Interior Design.** A study in basic philosophy of interior design both domestic and public. Analysis of art elements and principles of design applied to home planning and furnishing. (3F) **Larson**

**50. Art for Young Children.** For child development majors, mothers, kindergarten and first grade teachers. (3W, Sp) **Staff**

**53. Color Photography.** Primarily for the photography major or advanced amateur. Project assignments teach proper exposure of various color films used for projection, print and reproduction purposes. Various filters and lighting techniques are used for correction and creative effects. (3Sp) **Clark**

**54. Photo Lighting.** Basic indoor and outdoor lighting methods. Practical projects are assigned which emphasize floodlighting, flash, strobe and natural lighting. Prerequisites: Art 57 and 58. (3F) **Clark**

**56. Basic Photo Portraiture.** Using relatively simple methods, students learn to reveal personality and character, not just a likeness. Study of the subject, desirable backgrounds, composition, types of lighting, films, papers, and darkroom techniques are stressed. Prerequisites: Art 54, 57, 58. (3F) **Clark**

**57. Photo Fundamentals.** Correct camera operation, landscape and simple portrait picture taking, preparation and care of chemical solutions, negative development, contact printing and elementary enlarging. (3F, W, Sp) **Clark**

**58. Intermediate Photography.** Students seriously interested in photography will complete many picture taking assignments under a wide variety of conditions emphasizing proper exposure, careful composition and the creation of photographic prints which convey personal feeling. Prerequisite: Art 57. (3F, Sp) **Clark**

**59. Photo Lab Techniques.** Correct darkroom methods are stressed. A variety of problems in developing and printing are investigated; over and under development with necessary compensations in printing, spotting, etching, burning, dodging, retouching and toning are taught. Special negative control methods are introduced, such as: intensification, reduction, solarization and montage. Prerequisites: Art 57 and 58. (3W) **Clark**

**60. Beginning Sculpture.** A study of form and spatial relationships toward aesthetic expression. The various media, wood, stone, clay, metal and plaster and their respective techniques are explored individually and as a group. Prerequisite: Art 6. (3F, W, Sp) **Elsner**

**66. Creative Handweaving.** Introduction to basic elements and procedures of handweaving, providing a foundation for the creation of original design projects—place mats, rugs, wall hangings, room dividers, etc. (3-5F, Sp)

Larson

**81. Beginning Lettering.** Introduction to basic letter forms such as Roman, Gothic, and Scripts. (3W)

Anderson

**82. Beginning Advertising Design.** A class to introduce the student to the many different kinds of advertising media and techniques. An assignment is met in each media, as newspaper, magazine, outdoor advertising, trademarks, letterheads, and brochures; an understanding of lettering and type in advertising design. Prerequisite: Art 5, 6, 7, 8. (3F, Sp)

Anderson

**83. Beginning Illustration.** Basic technique in illustration. The course trains the student in producing professional advertising and illustrating art which would enable him to find employment in this field. Prerequisite: Art 8, 5, 9, 12. (3F, Sp)

Anderson

**85. Beginning Architectural Rendering.** Exploration of different media for architectural and landscape renderings. Students do finished renderings and begin to perfect a style of their own. (3Su or by special arrangement.)

Anderson

**101. Contemporary European Arts and Crafts.** An art appreciation course devoted to an investigation of current European creative efforts in painting, sculpture, and the varied crafts. Taught only on the Summer Art Tour of Europe. (3Su)

Tippetts

**103. High Renaissance Art.** A more specialized Art History class studying the works of Leonardo Da Vinci, Michelangelo, and Raphael, master painters of the Italian High Renaissance. Taught only on the Summer Art Tour of Europe. (3Su)

Tippetts

**104. Life drawing.** Anatomical and interpretive rendering of the figure in creative composition. Various ages, sexes, body types and races are studied. Prerequisites: 8, 9, 11, and 13. (F, W, Sp)

Van Suchtelen

**105. Advanced Drawing and Composition.** Emphasis is given to both imaginative and outdoor sketching, sketching from life, also composition and design. Prerequisites: Art 5, 8, 12. (3Sp)

Groutage, Thorpe

**106. Drawing Studio.** Advanced individual drawing problems in various media. Prerequisites: Art 104 and 105. Cr. arr. (F, W, Sp)

Van Suchtelen

**109. Landscape Painting.** Various approaches and techniques in landscape painting, in oil and related media. Field trips. Prerequisites: Art 8, 14. (3F, Sp)

Thorpe

**110. Modern European Painting.** This course will investigate some of the major trends in contemporary European painting. Major attention will be devoted to the "School of Paris" and modern Italian painters. This will be taught only on the Summer Art Tour of Europe. (3Su)

Tippetts

**111. Watercolor and Related Media.** Students may use any aqueous medium or combination. Several lab periods will be spent sketching out of doors. Prerequisite: Art 11. (3F, Sp)

Lindstrom

**112. Portrait Painting.** Problems of portrait painting with emphasis on the literal representation of form. Various ages and racial types are studied. Prerequisites: Art 8, 14. Cr. arr. (Sp)

Thorpe, Groutage

**113. Watercolor Studio.** Advanced painting problems in watercolor and related media. Prerequisite: Art 111. Cr. arr. (F, Sp)

Lindstrom

**115. Fabric Design. (Applied)** Projects in creating original designs and applying them to suitable textiles in techniques of silk screen printing, free-hand painting, block printing, stencil or batik. Desirable prerequisite: Art 5. (3Sp)

Larson

**116. Fabric Design. (Structural)** Projects in creating original designs and reproducing them in hooked rugs, upholstery fabrics, wall hangings, etc., and in various dramatic hangings and covers done in creative embroidery. Desirable prerequisite: Art 5. (3F)

Larson

**117. Fabric Design Studio.** Advanced individual projects in structural and applied fabric design. Prerequisites: 5, 8, 7, 115, and 116. Cr. arr. (F, Sp)

Larson

**118. Leathercraft.** Design and construction of wallets, belts, bags, briefcases, holsters, bridles and related projects. Executed in techniques of modeling, carving, stamping, imposing, etc. (3)

Staff

**\*\*119. Metalsmithing.** Continuation of Art 19. Introduction of forging of flatware and sand casting. Emphasis on original design of holloware, flatware, or other objects of the student's choice. Prerequisite: Art 19. (3Sp)

Staff

**\*\*120. Jewelry Casting.** Continuation of Art 20. Introduction of centrifugal investment casting, using wax as the creative medium. Original design of various types of jewelry; techniques necessary for the completion of the metal product. Prerequisite: Art 19. (3F, Sp)

Elsner

**121. Jewelry and Metals.** Studio. Advanced individual problems in various media. Prerequisites: 19, 119, 120. Cr. Arr. (Sp)

Elsner

**127. Painting Studio.** A course designed for advanced students in painting, students will

\*\*Taught 1969-70

be encouraged to develop their creative ideas through the process of experimentation in various applications in oil and related media. Work may be done in representational or non-representational areas. Prerequisite: Art 14. (3W, Sp) **Thorpe**

**128. Photo Studio.** Designed to cover several phases of Photography with emphasis on composing what we see in an artistic manner. Also, to allow Senior photo majors and selected Junior students to work with more concentration in their major area. Cr. Arr. (F, W, Sp, Su) **Clark**

**130. Ceramic Hand Building Techniques.** A course devoted to the production of pottery using techniques such as coils, slabs, pinching, etc. Large pieces can be produced quite easily with these techniques and will be encouraged. In addition, glazing and decorating will be an important part of this course. Prerequisites: Art 5, 6, 7, 30, 31. (3F, W, Sp) **Lindstrom, Elsner**

**131. Glaze Calculation.** Calculation of glaze formulas and operation of the kilns. Prerequisites: Art 5, 6, 7, 30, 31, 130. (3F, 3W, 3Sp) **Lindstrom, Elsner**

**132. Ceramic Studio.** Advanced work in area selected with the aid of the major professor. Prerequisites: Art 5, 6, 7, 30, 31, 130, 131. Credit arranged. (F, W, Sp) **Lindstrom, Elsner**

**136. Art Photography.** Means of producing fine photographs. (3F) **Staff**

**137. Art Photography.** Texture, composition, lighting and print quality. (3W) **Staff**

**138. Art Photography.** Introduction to color, color film, color harmonies, multiple exposures and other techniques necessary to produce fine color work. (3Sp) **Staff**

**140. Applied Interior Design.** Practical application of art elements and principles of design to problems of home decoration and furnishings. Prerequisite: Art 40. (3W, Sp) **Larson**

**142. Interior Design Studio.** A laboratory course devoted to such activities as the designing and constructing of two and three dimensional models, interiors, elevations and decorative details—traditional and contemporary, public and domestic. To be taken in conjunction with or following Art 140. Cr. arr. (W) **Larson**

**143. Advanced Problems in Interior Design.** Experimental projects in home planning and furnishing. Prerequisite: Art 142. (3-5 Sp) **Larson**

**144. Interior Design Apprenticeship.** A course designed to acquaint students who are planning to enter interior designing professionally, to actual business procedures as practiced by reputable, well-trained interior designers who have been approved by USU Art Staff. Prerequisite: Art 140. (1-5F, Sp, Su) **Larson**

**151. Art Methods for Elementary Grades.** Methods of teaching drawing, painting, design and handwork in the elementary schools. Required preparation for a grade school teacher. (3F, W, Sp) **Staff**

**152. Art Methods for High School.** Methods of teaching art in high school. How to motivate work in drawing, painting, design, and crafts. Required of all majors and minors in Art on secondary teaching level. (3 or 5F) **Staff**

**153-154. Art Education Workshop.** Help will be given on methods of presentation of many materials and techniques of practical value to the elementary and secondary teacher; chart making, posters, murals, dioramas, maps, color theory and harmony, weaving, basketry, gift making, flower and weed arrangements, and many other subjects. The workshop will give art instruction on the grade levels in which the teacher instructs. (3-5 Su) **Reynolds**

**157. Photography for Publications.** Photography for newspaper coverage of news events and sports, and for illustration in other media. Designed to meet specific needs of students who will prepare illustrated articles for publication. Prerequisites: Art 57, 58. (3Sp) **Staff**

**160. Advanced Sculpture.** Individual sculptural expression in a variety of plastic media. Emphasizes aesthetic employment of form and the techniques for working in wood, stone, metal, plaster and clay. Prerequisite: Art 60. This course can be repeated six times for credit. (3F, W, Sp) **Elsner**

**163. Sculpture Studio.** Advanced individual problems in various media. Prerequisites: Art 60 and 160. Cr. Arr. (F, W, Sp) **Elsner**

**\*164. Photo Illustration.** The major uses of photography in commercial advertising and illustration are stressed. Typical magazine and newspaper assignments are used on an individual project basis. Imaginative new ideas, novel techniques, and sensitive design layouts are emphasized. This course may be repeated a maximum of three times for credit. Admission only by permission of the instructor. (5W, Sp) **Clark**

**\*165. Advanced Photo Portraiture.** Intensive studio work and "on-the-job" portrait assignments are used to develop the insight and photo techniques necessary to produce portraits of consistently high quality for commercial studio, advertising, and editorial purposes. Admission only by permission of instructor. (5W) **Clark**

**166. Advanced Fabric Design in Weaving.** Special projects in applying original designs to creative weaving of tapestries, rugs and dramatic textiles. Prerequisites: Art 5 and 66 or equivalent. (3-5 F, W, Sp) **Larson**



**\*\*167. Color Printing.** Students are taught how to make consistently high quality photographic color prints from their own negatives. Project assignments are given to cover a wide range of subjects under various lighting conditions. Prerequisites: Art 53, 57, and 58. (3W) **Clark**

**168. Advanced Publications Photography.** Actual story assignments require the preparation of detailed shooting scripts, editorial selection of promising prints, cropping and final presentation of photo stories. Projects vary from single to multiple picture coverage. Admission only by permission of instructor. (5F, W, Sp) **Clark**

**169. Spinning and Dyeing.** Spinning and dyeing of wool, flax and other fibers in the production of special yarns for creative hand-weaving—artistic rather than commercial application emphasized. Prerequisite: Art 66. To be taught simultaneously with Art 166. (3W) **Larson**

**170. Photography Laws and Regulations.** A lecture course designed to fit the needs of photography and journalism majors and minors, and other students who may use the camera as a reproductive tool, by dealing with laws, regulations, principles, and practices governing photography. Included are copyright regulations, libel, model release, right of privacy statutes, courtroom regulations, photographic etiquette, and others. (1F) **Hansen**

**171 and 271. Special Studio Courses.** Individual work in any one or more of following, as approved by the instructor concerned: Design Studio, Painting Studio, Printmaking Studio, Photography Studio, Sculpture Studio, Experimental Media Studio, Metalsmithing Studio, Ceramics Studio. Credit arranged. (F, W, Sp) **Staff**

**181. Advanced Lettering.** Finished letters for magazine and newspaper advertisements, packaging labels and symbols. Prerequisite: Art 81. (3W) **Anderson**

**182. Advanced Advertising Design.** Theory of designing the cover, page, package, letterhead and T.V. The course trains the student in producing professional advertising which would enable him to find employment in this field. Prerequisite: Art 82. (3F, Sp) **Anderson**

**183. Advanced Illustration.** A course to prepare the student for the specialized field of illustration that exists today. The student experiments in different techniques and media, and learns which to use for different types of reproduction in newspapers or magazines. He learns to research a problem and meet deadlines. Prerequisite: Art 83. (3F, Sp) **Anderson**

**184. Commercial Art Studio.** Advanced commercial art problems with emphasis on designing displays, industrial design, packaging,

and projects in 2nd and 3rd dimension. Rendering in a variety of media for the portfolio. Prerequisite: Art 7. Cr. Arr. (F, W, Sp)

**Anderson**

**185. Advanced Architectural Rendering.** To perfect architectural renderings in various media to suit the student's own style in preparation for commercial work. Prerequisite: Art 85. (3Su or by special arrangement.) **Anderson**

**190. Survey of Mexican Art.** A survey course of Mexican Art covering colonial and modern architecture and the great Mexican painters, Rivera, Orozco, and Siqueroa. Taught only on the Summer Art Tour of Mexico. (3Su) **Lindstrom**

**191. Woodcut.** The making of prints from designs cut in wood using from one to many colors. (3F) **Groutage**

**192. Serigraphs.** The study of various techniques in silk screen printing including glue, tusche glue, cut paper, and lacquer film etc., for the purpose of making multiple original works of art. (3W) **Groutage**

**193. Lithography.** Producing prints from drawings on limestone. (3Sp) **Groutage**

**194. Intaglio.** Production of prints from metal plates using various etching and engraving techniques. (3W, Sp, Su) **Groutage**

**195. Printmaking Studio.** Individual production in prints using any technique. Prerequisite: Art 191 or 192 or 193 or 194. Cr. Arr. (F, Sp, Su) **Groutage**

**199. Senior Seminar.** A class designed to help Senior students prepare and complete final graduation requirements. Preparation and presentation of a portfolio and the Senior exhibition and reception will be covered. (1Sp) **Clark, Van Suchtelen**

**206. Drawing Studio.** Designed to further develop the student's creative attitude through exploitation of various drawing media and to guide him toward the direction of a personal idiom, during the process of exploring graphic concepts. Prerequisite: Graduate status. Credit arranged. (F, W, Sp) **Van Suchtelen**

**210. Thesis Photo Problems.** A seminar type course designed to aid graduate students in their photographic problems related to their thesis. Discussions will lend themselves mostly to methods of obtaining necessary photographs to supplement the thesis study. Students will be given information pertaining to the preparation of photos, charts, graphs, etc., for insertion into the final thesis. (1W) **Hansen**

**213. Watercolor Studio.** This studio is designed for graduate students doing the major part of their work in watercolor. All work and projects will be individually planned with the

**\*\*Taught 1969-70**



instructor's help. It is mainly individual instruction, criticisms, and evaluations. Prerequisite: Graduate status. Cr. Arranged. (F, W, Sp) **Lindstrom**

**217. Fabric Design Studio.** Advanced projects of original design executed in techniques of applied paints, dyes, etc. to fabric; structural stitchery; or weaving. Prerequisites: Art 115, 116, 166 and Graduate Status. Credit Arranged. (F, W, Sp) **Larson**

**221. Jewelry and Metal Studio.** Advanced individual problems in various media. Prerequisite: Graduate Status. Credit Arranged. (F, W, Sp) **Elsner**

**227. Painting Studio.** To provide an advanced painting studio opportunity for graduate students in which they develop further towards a professional stature. Emphasis is placed upon the individual attainment of a personal conviction or direction in painting. Prerequisite: Graduate Status. Credit Arranged. (F, W, Sp) **Staff**

**228. Photo Studio.** Designed to cover several phases of photography with emphasis on composing what we see in an artistic manner. Also, to allow graduate students to further emphasize the area of their chief interest, such as Advertising-Illustration, Industrial Portraiture, etc. Prerequisite: Graduate Status. Cr. Arranged. (F, W, Sp) **Clark**

**232. Ceramic Studio.** Graduate studio in ceramics. Work is planned on an individual basis with reference to the graduate student's spe-

cialty. All work is carried on in the lab with individual help and criticisms. Prerequisite: Graduate Status. Cr. Arranged. (F, W, Sp)

**Lindstrom**

**243. Problems in Interior Design.** Complete, professional presentations of actual or simulated projects in interior designing of domestic or public buildings and research projects in contemporary or traditional design media. Prerequisites: Art 142, 143 and Graduate Status. Cr. Arranged. (F, W, Sp) **Larson**

**263. Sculpture Studio.** Advanced individual problems in various media. Prerequisites: 60, 160 and Graduate Status. Credit Arranged. (F, W, Sp) **Elsner**

**272. Art Research and Thesis Problems.** Credit arranged. (F, W, Sp) **Staff**

**273. Art Seminar.** Directed individual study in assigned and elected problems later presented and analyzed at group discussions. Required of all graduate students. Credit arranged. (F, W, Sp) **Staff**

**284. Commercial Art Studio.** Advanced commercial art problems in advertising, illustration, displays, package design, lettering, and projects in second and third dimension rendering in a variety of media for the portfolio. Prerequisite: Graduate Status. Credit Arranged. (F, W, Sp) **Anderson**

**295. Print Studio.** Intensive individual production in advanced printmaking techniques. Prerequisite: Graduate Status. Credit Arranged. (F, W, Sp) **Groutage**

## Department of

# Audiology - Speech Pathology

**Head:** Professor Samuel G. Fletcher  
**Office in** Mechanic Arts 202

**Associate Professors** Frederick S. Berg, Jay R. Jensen, Richard D. Taylor; **Assistant Professor** Steven Viehweg; **Instructors** Thomas C. Clark, W. Jack Foreman, Jaclyn Littledike.

**Degrees:** Bachelor of Science (BS), Master of Science (MS)

**Majors:** Speech Pathology, Clinical Audiology, Educational Audiology, Communication Science.

The Department of Audiology-Speech Pathology offers a broad program leading to a Master's degree, with undergraduate support, in communication science and disorders. The student may follow either of two avenues to specialization within the department—

clinical or experimental. The clinical avenue leads to professional work in three areas with speech and hearing handicapped individuals. These areas are Speech Pathology, Clinical Audiology and Educational Audiology. The second avenue leads to a research and ex-

perimental career in Communication Science. The MS degree is available in the four specialization areas. The specialization in Educational Audiology receives cooperative assistance from the departments of Special Education, Elementary Education, and Psychology.

An understanding of communication disorders is best built upon a thorough knowledge of the basic processes of communication. Adequate provision is made in the graduate program at USU to enable students to obtain backgrounds in such subjects as anatomy, physiology, behavioral sciences, and experimental phonetics. Provision is also made to enable students to meet the requirements for their own unique professional aspirations. Therefore, beyond the basic background, each student and his graduate committee plan an individualized course of study.

The demand for specialists in Communication Science and disorders far exceeds the supply. Numerous opportunities and positions exist in regular and special public schools, rehabilitation centers, hospitals, research laboratories, universities, and many other settings. The student emerging from the graduate program may work primarily with people, with scientific instruments, or both. Certification of professional training is available through the American Speech and Hearing Association and the Utah State Department of Public Instruction.

The Audiology-Speech Pathology program at USU offers excellent opportunities for supervised clinical practicum experience with communicatively handicapped persons in a variety of professional settings. One of these, the USU Speech and Hearing Center, is conducted by the depart-

ment. The Center provides a service to the community but is used principally as a clinical laboratory for students. Dynamic up-to-date approaches to clinical training are employed. For instance, a portable television system affords students with self-viewing opportunities and enables them to watch demonstrations of master-clinicians at work. The television system gives instructional experiences which otherwise are difficult or impossible to obtain.

### Research Opportunities

A wide variety of research projects concerned with communication processes and communication disorders are being conducted on the Utah State campus. Among those currently being performed by the Audiology-Speech Pathology Department is one in which children of the Intermountain Indian School, located south of Logan, are being studied for deficiencies in communicative abilities. The ultimate goal of this study is to provide the information and guidelines necessary for establishing long range hearing and speech programs for Indians throughout the nation.

Another project is that of initiating and developing a statewide infant auditory screening program in which each infant born in Utah will receive, before leaving the hospital, hearing screening tests at the age of one to four days with intensive and extensive follow-up on those who fail. This program is a joint effort between the University and the Utah State Department of Health. The Audiology-Speech Pathology Department is conducting and guiding the program in both its theoretical and practical aspects.

Also concerned with infants is a departmental project designed

to investigate the ontogeny of infant vocalizations. This project will attempt to discover what patterns of learning sounds exist and how such patterns are structured and modified.

Other studies are being conducted in the areas of hearing aid evaluation, speech discrimination, consistency index construction, and sweep frequency audiometer design and construction. At present, the Department of Audiology-Speech Pathology is co-establishing an Interdepartmental Communication Science Laboratory staffed by the Departments of Audiology-Speech Pathology, Electrical Engineering, Psychology, Computer Science, Wildlife Resources, and Animal Science. The laboratory's staff will conduct electrophysiologic investigations into speech, hearing, and other communicative acts.

Other departments and agencies on campus are also conducting research into communication: Wildlife Resources Department (animal communication), U. S. Office of Agriculture (Teritology).

### Assistantships, Fellowships, Traineeships, and Grants

Financial aid for graduate students is available through assistantships, scholarships, undergraduate and summer traineeships, and fellowships. Among sources presently available are the following:

University Graduate Assistantship, \$1,000; Robert Shaw Scholarship Award, to \$700; Vera Gee Scholarship Award, to \$500; U.S. Public Health Service (NSDSP): Graduate Traineeships, \$250/month plus tuition and dependency allowances; Vocational Rehabilitation Graduate Traineeships, \$24 plus tuition.

U.S. Office of Education: Graduate Fellowships in the area of

Educational Audiology, \$2,000-\$2,400 plus tuition and dependency allowance.

**Graduate Fellowships** in the Area of Speech and Hearing, \$2,000-\$2,400 plus tuition and dependency allowance; U.S. Office of Education Summer Traineeships \$75/week plus tuition. VRA Graduate Fellowships.

**Research Assistantships.** Stipends vary with qualifications and responsibilities.

The various supports are offered on a competitive basis depending upon grade point average and recommendations from the institution of higher education in which undergraduate work was conducted.

### Student Organization

The Student Speech and Hearing Association contributes much to the program. Its activities are both social and professional. Each quarter the association sponsors a departmental journal, *THRESHOLD*, which provides a comprehensive information source concerning activities, progress and subjects of professional interest to students and faculty.

### Pathology Courses Audiology-Speech

**10. Remedial Speech.** For students with communication problems such that speech and/or hearing therapy is needed. Credit arranged. (F, W, Sp) Littlelike

**30. Introduction to Audiology-Speech Pathology.** Introduction to the Field of Audiology-Speech Pathology. Includes observation of diagnostic procedures and speech and hearing therapy. Selected readings required. (1F, W, Sp) Littlelike

**50. Fundamentals of Communication Science.** An introduction to the basic science of communication. Consideration given to the biological elements of sound production and manipulation, the physics and psycho-physics of sound, and the phonological principles and processes whereby sounds are combined into meaningful patterns. Laboratory demonstrations and applications are included. (5F) Fletcher

**70. Language, Hearing, and Speech Development.** Studies of normal speech, hearing, and language development. Some consideration given to disorders which may arise in these developmental processes. (3F, W, Su) **Staff**

**90. Phonetics.** An analysis of the phonetic and phonatory aspects of speech. (3F, Sp) **Jensen**

**100. Fundamentals in Speech Disorders.** Factors conducive to normal and abnormal speech development in the child. Attention given to problems of articulation disorders and stuttering. Recommended for prospective elementary school teachers. (5Su) **Staff**

**105. Speech Improvement in the Elementary Classroom.** Designed to provide the teacher with techniques to improve the listening, sound discrimination and production skills of children in the elementary grades. (3Su) **Staff**

**110. Fundamental Anatomy of Speech and Hearing.** A study of anatomy and physiology of the organs used in speaking and hearing. Emphasis given to developmental considerations. (5W) **Fletcher**

**120. Speech Pathology I.** Articulation and voice. Introduction to articulatory and phonatory problems—examinations, diagnostic and remedial procedures. (5W) **Jensen**

**125. Speech Pathology II.** Study of language and speech problems due to lesions of the nervous system including Cerebral Palsy, Aphasia and other dysarthrias. Prerequisites: A-SP 70, A-SP 120 or instructor's consent. (5Sp) **Jensen**

**130. Methods of Speech Correction.** Instruction given in appropriate and effective methods of speech therapy. Special attention paid to the techniques involved in therapy for articulatory errors. Should be taken concurrently with A-SP 135. (2W) **Littlelike**

**135a. Clinical Practicum-Speech Pathology.** Supervised diagnostic and remedial casework with speech handicapped individuals. May be taken more than one quarter. Credit arranged. (F, W, Sp) **Staff**

**135b. Clinical Practicum-Audiology.** Supervised diagnostic and remedial casework in audiology. May be taken more than one quarter. Credit arranged. (F, W, Sp) **Staff**

**135c. Clinical Practicum-Educational Audiology.** May be taken more than one quarter. Credit arranged. (F, W, Sp) **Staff**

**145. Stuttering.** Theoretical, clinical and experimental approaches to stuttering and other disorders of speech rhythm. (3Sp) **Jensen**

**150. Audiology I.** The process of hearing and hearing disorders, and introduction to the field of clinical audiology. (5F) **Taylor**

**155. Audiology II.** Principles and techniques of audiometric assessment. Prerequisite: A-SP 150. (3W) **Taylor**

**160. Audiology III.** Advanced theory and practice of audiological evaluation. Prerequisite: A-SP 155. (3Sp) **Taylor**

**170. Speech for the Hearing Impaired.** Acoustic and spectrographic identification of the speech of individuals with varying hearing impairments; principles, techniques, devices and equipment for developing and correcting the speech of the hearing-impaired; case studies. (3) **Berg**

**172. Language for the Hearing Impaired I.** Language problems of the hearing impaired. Theories and methods of developing and teaching language. (3W) **Clark**

**174. Language for the Hearing Impaired II.** Structured language procedures used with children with a severe hearing impairment. Reading problems in relationship to hearing loss. Reading instruction from preschool through high school for hearing impaired children. (3Sp) **Clark**

**176. Language for the Hearing Impaired III.** Specific methodology in the development of skills in the area of social studies, science, and arithmetic, demonstrations and tutoring experience-cooperative faculty. (3F) **Clark**

**178. The Young Hearing Impaired Child.** Problems of teaching hearing impaired children of preschool age; observation and teaching in the preschool department of the Idaho State School for the Deaf. (3F) **Rupert**

**180. Dactylogy.** A study of manual communications as used by the hearing impaired (Deaf) in America. Fingerspelling, manual signs, natural gestures, and combinations of manual communication with oral communication will be studied. Students will acquire a basic knowledge of the use of manual communications. (2Su) **Clark**

**190. Problems in Audiology-Speech Pathology.** Selected work, individually assigned, handled and directed. Problems of mutual interest to students and the instructor are investigated and reported upon. Prerequisite: Instructor's consent. Credit arranged. (F, W, Sp) **Staff**

**220a. Seminar in Communication Science.** Consideration of fundamental science topics pertinent to advanced study in Speech Pathology, Audiology, and Speech and Hearing Science. Prerequisite: Instructor's consent. (2F) **Fletcher**

**220b. Seminar in Speech Pathology.** Prerequisite: A-SP 125 or instructor's consent. (2W) **Jensen**

**220c. Seminar in Audiology.** Prerequisite: A-SP 160 or instructor's consent. (2Sp) **Taylor**

**220d. Seminar in Educational Audiology.** Prerequisite: Instructor's consent. (1-2F, W) **Staff**

**225. Diagnostic Methods in Speech Pathology.** Diagnosis and appraisal of speech disorders, including principles and techniques used in case study interview. Prerequisite: A-SP 125. (3W) **Staff**

**230. Medical Background in Speech Pathology and Audiology.** Speech and hearing specialists and medical specialists participate jointly in a series of lectures with communication disorders and the multidisciplinary approach to treatment as the common core of concern. Prerequisite: A-SP 120. (4Su) **Staff**

**235a. Clinical Practicum-Speech Pathology.** Continuation of A-SP 135a. Emphasis given to supervised laboratory experience in analysis, diagnosis, and habilitation of the more complex communication disorders in a variety of clinical settings. Credit arranged. (F, W, Sp) **Staff**

**235b. Clinical Practicum-Audiology.** Continuation of A-SP 135b. Emphasis given to supervised laboratory experience in analysis, diagnosis, and habilitation of the more complex communication disorders in a variety of clinical settings. Credit arranged. (F, W, Sp) **Staff**

**235c. Clinical Practicum-Educational Audiology.** Continuation of A-SP 135c. Emphasis given to supervised laboratory experience in analysis, diagnosis, and habilitation of the more complex communication disorders in a

variety of clinical settings. Credit arranged. (F, W, Sp, Su) **Staff**

**240. Public School Clinical Practicum.** Supervised diagnostic remedial and casework in public school speech correction. Prerequisite: A-SP 125. (4-8F, W, Sp) **Staff**

**250. Experimental Phonetics.** (3Sp) **Fletcher**

**260. Pediatric Audiology.** Special tests and procedures for examining hearing of infants and small children. Prerequisites: A-SP 150, 155, 160. (3F) **Taylor**

**270. Speech Reading.** Principles and methods pertaining to optimal use of visual perception by persons with impaired auditory acuity. (3F) **Berg**

**275. Auditory Training.** Principles and methods pertaining to optimal use of residual hearing by persons with impaired auditory acuity. (3W) **Taylor**

**276. Communication Problems of the Hard of Hearing.** Covers communication problems associated with hearing deficiencies. (2F) **Berg**

**290. Research Studies.** Advanced research in Audiology-Speech Pathology. Credit arranged. (F, W, Su) **Staff**

**295. Thesis.** Credit arranged. (F, W, Sp, Su) **Staff**

**296. Case Study Thesis.** Credit Arranged. (F, W, Sp, Su) **Staff**

## Department of

# English and Journalism

(English, American Studies and Journalism)

**Head: Professor T. Y. Booth**

Office in Library 418

**Professors** Carlton F. Culmsee, J. Lynn Mortensen, Veneta L. Nielsen, John M. Patrick, Moyle Q. Rice, Hubert W. Smith, John J. Stewart; **Professor Emeritus** King Hendricks; **Associate Professors** Kenneth B. Hunsaker, Reed C. Stock; **Assistant Professors** J. R. Allred, Theodore Andra, Richard J. André, William E. Carigan, Del Rae Christiansen, Zenna Beth Crockett, Patricia Gardner,<sup>1</sup> H. B. Kulkarni, Thomas J. Lyon, Dean Morgan, Marlan Nelson, Don M. Ricks, Dean O. Skabelund; **Instructors** Jean Andra, Deborah S. Crehan, Allene D. Dotson, Joan P. Hansen, Kristian Koford, Idella Larson, Anita Leishman, Andrea L. Peterson, Joan A. Sanders, Ronald W. Smith, Roberta Sorenson, Diana Summerhays, Eugene Valentine, Lynne Wangsgard, Glenn Wilde; **Lecturer** Coralie M. Beyers.

**Degrees:** Bachelor of Arts (BA), Bachelor of Science (BS), Master of Arts (MA)

**Majors:** English, English Teaching, American Studies, Journalism.

<sup>1</sup>On leave.



## English

The English and Journalism program is designed to meet the ever-increasing demand for English-trained personnel in mass communications, in industrial writing and editing, in graduate schools, in public relations work, and in teaching. The need for teachers of English grows more critical each year at all levels.

## Undergraduate Study

### The Standard English Major

The student may complete the Standard English Major and the necessary requirements for certification during four years. This will qualify him for either graduate work or secondary teaching. The program requires completion of general lower division requirements, including Freshman English; a minimum of 24 credits in an approved foreign language, and 46 to 51 credits in English.

The 46-51 credits must include 15 credits from lower division survey courses 40 or 41; 50; 60 or 61. Twenty-one credits of the 46-51 are required from the core program of literary periods numbered 166 or 171; 175 or 180; 190 or 191; 155 or 156; 157 or 158. The remaining 10 to 15 credits will be chosen from the specialized literary studies and technical courses. The student and his adviser will work out a program involving courses in each of these four areas: Major Figures: 154, 159, 162, 163, 164, 165, 167, 170; Types: 132, 137, 138, 139, 150, 151, 152, 153, 168, 169; World Literature: 140, 141, 142, 147, 148, 149; and Technical 104, 112, 117a, b, c, and 134. Prospective teachers must take both 104 and an advanced writing course.

Prospective teachers are en-

couraged to elect Theatre Arts 166 and Journalism 191.

This four-year course may qualify the student for admission into the School of Graduate Studies.

### English Teaching Major

An "application for admission to teacher education" should ordinarily be completed before the Junior year (see College of Education for requirements). Approval is a prerequisite to teacher certification candidacy and to enrollment in Education and Psychology courses.

Students who do not intend to go beyond the Bachelor's degree in English, but who plan to teach at the secondary level are expected to complete the Standard English Major except for the language requirement and at the same time must meet the requirements for teacher certification. Students who take this major will need to complete the language work of the regular major if they decide to take a graduate degree in English.

### The English Teaching Minor

In addition to the Basic Communications and general humanities requirements, the student should complete a minimum of 24-27 credits in English as follows:

a) Lower division (10 credits): 50 and either 60 or 61.

b) Upper division (8-11 credits): 132 or 150; one of the novels courses, 137, 138, or 139, or 151; 163 or 164.

c) Technical (6 credits): 104 and either 112 or 117b.

Students are encouraged to supplement these required courses with courses in world literature.

Any deviation from this plan must have the approval of the Head of the English Department or one of the departmental advisers.

**The American Studies Major**

The American Studies major is designed to cultivate a broad understanding of American culture and its antecedents. It emphasizes the inter-relationships that exist in American literature, history, institutions, philosophy, and arts. In addition to offerings in the College of Humanities and Arts, it combines courses from the College of Business and Social Sciences. The requirements are as follows:

A) Complete a minimum of 36 credits in English, American, and World Literature from the following or other approved courses: 40, 41, 50, 58, 60, 61, 142, 147, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159.

B) A minimum of 16 credits in History, including courses 20 and 155. Additional upper division American History courses may be selected.

C) A minimum of 11 credits in Political Science, preferably 10, 101, 117, 118, 119.

D) A minimum of six credits in the following areas: Economics, Sociology, Art, Music, and Education.

E) A minimum of 24 credits in a foreign language approved by the chairman of the American Studies Committee.

A student majoring in American Studies is not required to complete a minor. Contact Professor Kenneth B. Hunsaker to have course of study approved.

**Journalism Major**

The program leading to a Bachelor of Arts or Bachelor of Science degree in News-Editorial Journalism is designed to equip the student with an adequate set of professional values, to provide a broad background in the humani-

ties and social sciences, and to provide adequate training in skills and techniques that will prepare the student for a career in journalistic work.

A student who majors in Journalism must complete 45 credits in Journalism courses; 40 of these are designated:

Journalism 12, 13, 14, 91, 106, 112, 113a, 114a,b,c, 125, 126, 150, 164, 199.

Art 57 and 157 and Political Science 15 are recommended for Journalism majors.

Majors in Journalism must complete two upper division courses in two of the following departments: History, Political Science, Psychology, Sociology.

Two years of a foreign language are suggested but are not required. Journalism majors should consult Professor Marlan D. Nelson, Journalism adviser, Library 235.

**Journalism Minor.** A minor in Journalism consists of 18 credits. Required courses in the minor are Journalism 12, 13 and 199. In addition to these courses, the student should select 8 credits from Journalism 14, 112, 150, 164, 166, 184, 191.

**Journalism Teaching Major**

A student who wishes to be certified in journalism must complete a minimum of 42 credits of journalism as follows: Journalism 12, 13, 14, 106, 112, 113a, 114a,b,c, 125, 126, 150, 191, 199 with 5 credits elected from Journalism 184, 166, 1, 2, 3. Fine Arts 57 is recommended as a complement to the major.

The student must also complete a minimum of 25 credits as a teaching minor. The minor should be selected from among those courses which are required in all Utah high schools. Professional

Education requirements for certification are listed under the College of Education.

### **Journalism Teaching Minor**

A student who wishes to be certified in journalism as a minor field must complete a minimum of 25 credits as follows: Journalism 12, 13, 14, 112, 113a, 150, 191, and 199. Teaching minors are also encouraged to take at least two quarters of practice work on the staff of **Student Life**.

### **Graduate Study**

**Master of Arts Degree.** The Department of English offers programs leading to the Master of Arts in English and in American Studies. In each of these fields, two programs are available. The first consists of 45 credits (of which at least 20 credits, exclusive of thesis, must be in courses numbered above 200, these to include at least three seminars), including a thesis for which either 9 or 10 credits are given. The second program also consists of 45 credits, but instead of a thesis the candidate must complete at least 30 credits of work in the courses numbered above 200, these to include at least four seminars. All candidates take a final oral examination of approximately two hours' duration, covering the material of their undergraduate and graduate programs. The focus will be on the thesis for those who have written one.

The following requirements of the graduate program are presented only in summary. The student should consult the USU Graduate Catalog for further explanations and more detailed regulations.

To complete the degree, the candidate must 1) file an application for admission to graduate study

with the School of Graduate Studies, and, upon acceptance, consult with the chairman of the departmental Graduate Committee, Dr. Hubert Smith, L436; 2) take the Graduate Record Examination given by the School of Graduate Studies during the first quarter in residence; 3) take, during the first quarter in residence, a departmental preliminary examination in the field of English or American Studies; 4) select, in consultation with the Head of the English Department and the chairman of the departmental Graduate Committee, one of the two programs leading to the degree and be assigned a major professor and a committee; 5) complete English 201 (English majors must also take English 209; American Studies majors must take one of the following: English 162, 205, 209, or 261); 6) complete satisfactorily the additional required course work outlined by his major professor; 7) pass an examination on 15 books recommended by the English Department at least one month before the end of the quarter in which the degree is to be granted; 8) file with the departmental Graduate Committee a statement of language proficiency in the language offered for the degree, from the Department of Languages; 9) present an acceptable thesis, or, if the alternate program is selected, complete the necessary additional credit in courses numbered above 200; and pass a comprehensive oral examination.

**Master of Arts in American Studies.** Candidates for the Master's degree in American Studies are required to present a Bachelor's degree with American Studies, English, History, or Political Science as a major. The course of study will be arranged in consulta-

tion with any member of the American Studies Committee and is subject to approval by the chairman of the committee. The emphasis in graduate work will be largely governed by a) the student's cultural and professional objectives and b) his undergraduate course work.

Total credit and examination requirements are in general the same as those for the Master's degree in English. However, the departmental qualifying examination will be administered by the American Studies Committee and will cover primarily American Literature, American History, and American Political Institutions.

The student shall be required to demonstrate proficiency in a foreign language, usually French or German, and this proficiency is to be determined by the Head of the Department of Languages.

A selection of the following courses may be applied toward satisfying requirements for the Master's degree in American Studies: English 142, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 201, 251, 252, and 253; History 142, 143, 144, 145, 146, 147, 155, 171, 203, and 224; Political Science 101, 117, 118, 119, 125, 127, 140, 180, 181, 182, 201, 207, 208, and 209.

As many as ten credits may also be drawn from upper division courses in the following subject matter fields: English and Comparative Literature, English and World History, Philosophy, Art, Music, Sociology, and Economics. All students must take at least one of the following: English 162, 205, 209, 261.

In American Studies (as in the regular English program) the student may elect an alternate plan which requires a minimum of 45 credits of which at least 30 must be in courses numbered above 200.

**Assistantships.** Some assistantships are available for students who qualify as Master's candidates in the English Department. Interested students should make formal application to the Head of the English Department.

## English Courses

**0. Remedial English.** Required of students whose predicted college grade point is below 1.70. Students must obtain a passing grade in this course before they will be admitted to English 1. (Non-credit) **Staff**

**1, 2, 3. Freshman English.** (Previously known as Basic Communications). Required of all Freshmen. Designed to increase the skills of students in writing and reading. (3 each) **Staff**

**4. Elements of Grammar.** For students who wish training in grammar beyond that given in Freshman English. (3) **Staff**

**5. Vocabulary.** A study of word formation and derivation as a means of understanding scientific terms and of increasing vocabulary. (3) **Staff**

**12a, 12b. Practice in Composition.** For students who wish practice in composition beyond that given in Freshman English. (2 each) **Staff**

**14, 15, 16. English for Foreign Students.** See Language Department, English 14, 15, 16. (3 each) **Staff**

**24. Introduction to Literature.** Introduces the student to an understanding of the methods of the literary artist and the meaning of his work through the study of poetry, prose, and drama. Provides a foundation both for additional courses in literature and for individual reading. (3) **Staff**

**33. Readings in Short Story.** (3) **Rice Carigan**

**34. Great Books and Ideas.** Man's ideas about himself, the universe, and the divine. (3) **Rice, Nielsen, Skabelund**

**35. Great Books and Ideas.** Man's ideas about social relationships. (3) **Nielsen, Rice, Skabelund**

**36. Great Books and Ideas.** Man's ideas about the modern world. (3) **Rice, Nielsen, Skabelund**

(Courses 34, 35, 36 are related but they are taught as independent units and need not be taken as a series.)

**37. Readings in the Novel.** (3) **T. Andra, Carigan, Morgan, R. Smith**



40. **World Literature Before 1650.** (5) Nielsen
41. **World Literature from 1660 to the Present.** (5) Nielsen
42. **Readings in Mythology.** (3)  
Crockett, Nielson, Rice, Skabelund
48. **Modern European Literature.** (3) Staff
50. **American Literature Survey.** (5)  
Hunsaker, Lyon, Morgan, R. Smith
58. **Modern American Literature.** (3)  
Hunsaker
60. **English Literature, Early Period.** (5)  
T. Andra, Crockett, Gardner
61. **English Literature, Late Period.** (5)  
T. Andra, Christiansen, Crockett, Kulkarni
68. **Modern English Literature.** (3) Kulkarni
104. **Grammar.** Designed for teachers. (3)  
Mortensen
111. **Technical Writing.** Effective communication of ideas via the technical report and the scientific article. For Junior and Senior students of forestry and the natural sciences. Others admitted only with consent of instructor. (Needs of students majoring in arts, letters, education, business, or the social sciences are met by English 112. Students of engineering are directed to English 113.) (3)  
Ricks, Crehan
112. **Advanced Expository Writing.** Concerned with theory, examples, and practice of general expository writing. Emphasizes organization, paragraph development, diction, and revision. Open to all upper division students and others by permission of instructor. (3)  
Mortensen, Hunsaker, Skabelund
113. **Engineering Reporting.** Instruction in style, forms, and techniques of engineering reporting. Open only to students registered in the College of Engineering. (Students majoring in physical sciences may be admitted with consent of instructor. Students in other majors are not admitted.) (3)  
Valentine
117. **Creative Writing**
  - a) Short Stories. (3) Rice
  - b) Essays. (3) Rice, Culmsee
  - c) Poetry. (3) Nielsen
122. **Children's Literature.** Prose and poetry of children to the junior high school age. (3)  
Mortensen
123. **Literature for Adolescents.** Prose and poetry of the high school age. (3) Mortensen
132. **Readings in Poetry.** An analytical approach to techniques, traditional and modern, and major thought currents of the poetry expressing the twentieth century in relation to backgrounds both old and new. (3) Nielsen
134. **Literary Criticism.** An analytical rather than historical approach to criticism, intended to deepen the student's insight into the nature and purpose of the forms of literature, and to develop literary taste and judgment. (4)  
Patrick
137. **English Novel, Eighteenth Century.** A study of the major English novelists of the eighteenth century. (3) Christiansen
138. **English Novel, Nineteenth Century.** A study of the major English novelists of the nineteenth century. (3) Booth, Christiansen
139. **Twentieth-Century Novel.** A study of major twentieth century novelists. (3)  
Christiansen
140. **Greek Literature.** Masterpieces of Greek literature, with emphasis upon drama. All readings in English translation. (5) Stock
141. **Roman Literature.** A study of selected major literary contributions of the Romans. All readings in English translation. (3) Stock
142. **The Bible as Literature.** A survey of the major writings from the Hebrew tradition in the King James Version of the Old Testament, the Apocrypha, and the New Testament. (5)  
Staff
147. **Comparative Literature.** The eighteenth century in France and England. (3) Staff
148. **Comparative Literature.** The Romantic period in England and Germany. (3) Patrick
149. **Comparative Literature.** The nineteenth century in England and Europe. (3) Hendricks
150. **American Poetry.** From Philip Freneau to the present. (3) H. Smith, Hunsaker
151. **American Fiction.** Nineteenth and early twentieth century fiction writers. (3)  
H. Smith, Culmsee, Hunsaker
152. **American Drama.** Historical treatment of American drama: extensive reading of representative plays. (3)  
H. Smith
153. **Western American Literature.** Literature of the trans-Mississippi West, from the early explorers through the period of settlement. Background material from early journals and official records will be examined. The principal emphasis of the course will be on the novels and short stories depicting the explorers, mountain men, miners, cattlemen, and homesteaders. (3)  
Lyon
154. **Readings in Individual American Authors.** Each course in this series involves a comprehensive reading of one author and a high



level understanding of his content and style. There is no prerequisite. (a) Thoreau, (b) Whitman, (c) Twain, (d) O'Neill, (e) Faulkner, (f) Hemingway, (g) Jack London. (2)

**Staff**

**155. The Colonial Period in American Literature.** An introduction to germinal ideas of American thought and institutions as formulated by the Puritans and other writers of the period. (3)

**Staff**

**156. The Age of Reason in American Literature.** Eighteenth century American writing, with particular emphasis on the impact of deism on literary, political, and religious thought. Concentration on such writers as Mayhew, Wise, Edwards, Franklin, Jefferson, Paine, Freneau, Brackenridge, Tyler, and Rush. (3)

**H. Smith**

**157. The American Literary Renaissance.** The rise of social, political, philosophical, and religious liberalism and idealism as reflected by authors from Irving to Whitman, with special emphasis on the transcendentalist movement. (3)

**H. Smith**

**158. Realism and Modernism in American Literature.** The turn late in the nineteenth century to realism and naturalism in the works of Twain, Howells, James, Crane, Norris, Garland, and Dreiser. Twentieth century literature as a reflection of social, economic, and political issues growing out of America's industrialization and role of world dominance. (3)

**H. Smith**

**159. Critical Studies of Individual American Authors.** Each course is an intensive study of the major works of one author with special concern given to matters of text, bibliography, and significant critical writings about the author's work. Open only to upper division and graduate English majors and to others by consent of the instructor. (a) Emerson, (b) Hawthorne, (c) Melville, (d) James. (2) Staff

**162. Chaucer. (5)**

**Hendricks**

**163. Shakespeare. Comedies and History Plays. (5)**

**Patrick, Ricks**

**164. Shakespeare. The Tragedies. (5) Patrick**

**Ricks**

**165. Readings in Individual English Authors.** No prerequisite. (a) Wordsworth, (b) Byron, (c) Shelley, (d) Tennyson, (e) Browning, (f) Hardy. (2)

**Staff**

**166. Medieval English Literature.** A study of English literature from the beginnings to the Renaissance. The earlier work that presents a linguistic difficulty will be studied in translation. (5)

**Stock, Ricks**

**167. Critical Studies of Individual English Authors.** Each course is an intensive study of the major works of one author with special

concern given to matters of text, bibliography, and significant critical writings about the author's work. Open only to upper division and graduate English majors and to others by consent of the instructor. (a) Donne, (b) Dryden, (c) Swift, (d) Arnold. (2)

**Staff**

**168. English and European Drama, Medieval to Nineteenth Century. (5)**

**Morgan**

**169. Modern Drama. Ibsen to the present. (5)**

**Booth**

**170. Milton. (3)**

**Rice, Stock**

**171. The English Renaissance.** A study of English literature of the sixteenth century and its continental backgrounds. (5)

**Ricks**

**175. Seventeenth Century Literature. (5)**

**Stock**

**180. Eighteenth Century Literature. (5)**

**Skabelund**

**190. The Romantic Period. (5)**

**Patrick**

**191. The Victorian Period. (5)**

**Booth, Christiansen**

**199. Readings and Conference.** Any quarter. Students must have the approval of the Head of the Department. Credit arranged.

**Staff**

**200. Thesis. Credit arranged.**

**Staff**

**201. Bibliography and Methods.** Required of all candidates for the Master's degree in English. (3)

**Ricks**

**202. a, b, c, Problems in Teaching Freshman English.** A course designed to help the graduate assistants meet the actual classroom problems in Freshman English. Required of all teaching assistants. (1F, 1W, 1Sp)

**Staff**

**205. History of the English Language. (3)**

**Hendricks**

**209. Anglo-Saxon.** Required of all candidates for the Master's degree. (5)

**Hendricks**

**234. Seminar in Modern Criticism.** Critical theories and methods of significant twentieth century English and American literary critics, including T. S. Eliot, I. A. Richards, Cleanth Brooks, R. P. Warren, William Empson, Kenneth Burke, and others. (3)

**Patrick**

**251. Seminar: Early American Literature.** (a) The Puritan Mind, (b) The Impact of Deism, (c) Democracy and Religious Diversity. (3)

**Staff**

**252. Seminar: Nineteenth Century American Literature.** (a) The New England Circle, (b) Romanticism and Regionalism: Mid-Atlantic, South, Frontier, (c) The Rise of Realism and Naturalism. (3)

**Staff**

253. **Seminar: Twentieth Century American Literature.** (a) Modern Poetic and Critical Schools. (b) Modern Fiction and Drama. (c) Influences of Modern Science and Philosophy. (3) **Staff**

261. **Reading of Middle English.** (3) **Hendricks**

265. **Seminar in English Authors.** (a) Bacon. (b) Spenser. (c) Marlowe and Jonson. (3) **Staff**

271. **Seminar in the English Renaissance.** (3) **Ricks**

275. **Seminar in Seventeenth Century Literature.** (3) **Ricks**

280. **Seminar in Eighteenth Century Literature.** (3) **Staff**

290. **Seminar in Late English Literature.** (a) Romantic Period. (b) Victorian Period. (c) The Twentieth Century. (3) **Staff**

295. **Methods in Presenting Literature to the Gifted.** See Special Education 295. (3W) **Staff**

299. **Independent Study.** Independent study with credit arranged. Open only to graduate students in English. (1-5) **Staff**

## Journalism Courses

1, 2, 3. **College Journalism.** For members of Student Life Staff. Discussion of newspapers and responsibilities of journalism. May be repeated once for credit. (1 each) **Nelson**

10. **Critical Analysis of the Newspaper.** Study of significant current news practices and their relation to society. Emphasis upon examination of techniques used by editorial writers and columnists; attention given to methods of news analysis and comment. (2) **Andre**

12. **Introduction to Journalism.** Lectures on historical, social, and vocational aspects of the newspaper, magazine, book, radio, television, motion picture, public relations, advertising, journalism teaching; also, the psychology of news. (3) **Nelson**

13. **Reporting.** Continuation of 12 with emphasis on newspaper style, social responsibilities, and problems of reporting. Practical experience in laboratory work writing for newspapers. (5) **Nelson**

14. **Editing and Copy Reading.** An introduction to news editing and copy reading. Basic elements of newspaper style; newspaper usage, improvement of news presentation. Lecture and laboratory work. (3) **Staff**

91. **Weekly Newspaper.** Problems of editing and publishing weeklies. Efforts are made to provide laboratory experience in a weekly newspaper. Field trip required. (3) **Nelson**

92. **Weekly Newspaper Internship.** Six or more weeks' work in the summer on a weekly newspaper. Prerequisite: Journalism 91. (Time and credit arranged.) **Staff**

**\*\*106. American Mass Media and Propaganda.** Development of American publications and electronic means of disseminating information and propaganda; also, main currents in thought conveyed by these mass media. (Alternate years) (5) **Andre**

112. **Writing Feature Articles.** Lectures and practice in preparing feature articles for newspapers and magazines. Analysis of periodicals is made to determine what editors buy. (3) **Andre**

113a. **Reporting Public Affairs.** Coverage of local, state, federal courts; municipal, state and federal government administration in the local community. Laboratory work included. Prerequisite: Journalism 14. (3) **Andre**

113b. **Reporting Sports.** Techniques and principles of reporting and writing sports; attention also given to sports coverage by other media. (3) **Staff**

114. **a,b,c. Advanced Copyediting.** Continuation of Journalism 14. Study of advanced principles of editing, makeup, and editorial policies involved in the editing process. Laboratory work included. Course must be taken for three-quarter sequence. (1 each) **Nelson**

125. **Editorial Writing.** Study of the editorial and its place in opinion formation in the mass media. Attention given to the planning, researching, and writing of editorials and editorial campaigns. Lecture and laboratory work. (2) **Nelson**

126. **Law of the Press.** Introduction to law of the press: attention given to basic principles of the law of libel, privacy, copyright, press freedom and responsibility as they specifically apply to the news media. (2) **Andre**

150. **Mechanics of Publishing.** Study of planning and business sides of newspaper publishing. Designed to familiarize the student with the equipment of a newspaper plant; expenses of publishing a paper; sources of income; circulation and advertising problems; labor problems. Prerequisite: Journalism 13. (3) **Nelson**

164. **Publicity Methods.** Media and methods used to inform the public and conduct public relations work as required by corporations, public institutions, service organizations, and governmental agencies. Prerequisites: Journalism 13 and 14, or permission of instructor. (3) **Staff**

166. **Journalism Practices.** Laboratory work in publications, radio, or television. (2) **Staff**

**\*\*Taught 1969-70.**

184. **TV Writing.** Writing and editing news, drama, and other television material. To be studied concurrently with Speech 181. (3) **Staff**  
185, 186, 187. **Special Problems in Journalism.**

**Nelson**

191. **School Publications.** For the prospective teacher. Problems of advising staffs of school newspapers, yearbooks, and magazines. (3)

**Andre**

199. **Senior Seminar.** Investigation of current problems in Journalism; introduction to elementary research methods in Journalism; study of selected group of books on journalism taken from the "Essential List of Readings" compiled by Frank Luther Mott. Prerequisite: Senior standing. Required of all Journalism Seniors. (2)

**Nelson**

### Department of

## Landscape Architecture and Environmental Planning

**Head: Professor** Burton Taylor  
Office in Main 1

**Professor Emeritus** La Val S. Morris; **Assistant Professors** Jon Anderson, Malcolm G. Bishop, Craig Johnson, J. Derle Thorpe, Bernard G. Wesenberg; **Instructors** Glen L. Baron, Vern Budge, Roger Keith, David Kotter, Fred Von Niederhausern; **Visiting Critics** Burtch Beall, AIA, Owen Burnham, AIP, Garret Eckbo, ASLA, Leon Frehner, ASLA, Karsten Hansen, ASLA, Gerald Kessler, ASLA, Kenji Shiozawa, ASLA; **Visiting Professors** Richard Toth, Donald Walker.

**Degrees:** Bachelor of Landscape Architecture (BLA), Master of Landscape Architecture (MLA), Master of Science in Environmental Planning (MSEP)

**Majors:** Landscape Architecture and Environmental Planning.

The Department of Landscape Architecture and Environmental Planning at Utah State University presents a curriculum accredited by the American Society of Landscape Architects. Landscape Architecture and Environmental Planning is concerned with the performance of arranging land and the objects upon it for human utilization. The curriculum is arranged to provide the student with a broad but well-disciplined background so that, upon graduating, he may perform in numerous capacities including land planning, recreation, industrial facilities planning, and site selection, as well as in the traditional aspects of landscape architecture. Emphasis is placed

on creating for man an environment appropriate to his needs. Class projects range from residential planning problems through institutional and complete community, recreational, and ecological development plans.

### Undergraduate Study

Students should plan to spend the equivalent of one year in practical experience, which may be filled by summer work during residency.

**Bachelor of Landscape Architecture Degree (BLA).** For a major in Landscape Architecture and Environmental Planning, the following are provided: 1) Necessary

instructional material directly concerned with Landscape Architecture and Environmental Planning; 2) supporting courses in related fields such as civil engineering, visual arts, physical sciences, and communications; 3) courses required for a liberal education. The student in some cases may take a Bachelor of Science degree. However, the BLA is recognized as having met the minimum satisfactory educational standards. In pursuing the Bachelor of Science degree, certain adjustments may be necessary aside from the normal curriculum.

**Candidacy.** In order to become a candidate for entrance to upper division and graduation in LAEP, a student must have successfully completed all lower division courses.

**Minoring Degree.** Students majoring in other departments can obtain a minor in Landscape Architecture by successfully completing with a "B" or better LA 35, 60, 61, 62, 80, 81, 82, 140, 141, 142 or in individual cases by arranging with the Department to take LA 190, Special Problems, which would be adapted to the specific student's needs. LA 20, 30, 40, 60, 80 series are prerequisites for all upper design series.

## Lower Division

### FRESHMAN YEAR

Course	Credits
LA 3, Elements of Land Planning .....	3
LA 20, Graphics .....	3
LA 35, Theory of Design .....	3
LA 30, 31, 32, Interpretive History and Design .....	9
Math 34, 35, Algebra .....	8
Math 46, Trigonometry .....	5
Biology 15, Botany 26 .....	10
English 1, 2, 3 .....	9
Geology 3 .....	3
	53

### SOPHOMORE YEAR

Course	Credits
LA 40, 41, 42, Plant Materials .....	9
LA 60, 61, 62, Architectural Design .....	9

Physical Science 31, 32, 33 .....	9
CE 80, 81, Plane Surveying .....	6
LA 80, 81, 82, Applied Theory of Design and Structures .....	9
Art 5 or 8 or 10 .....	3
Sociology 70 .....	5
Soils 56 .....	4
	54

## Upper Division

### JUNIOR YEAR

Course	Credits
LA 140, 141, 142, Design .....	9
LA 150, 151, 152, Planting Design .....	9
LA 170, City and Regional Planning .....	3
Speech 1, Fundamentals of Speech .....	5
Art 14, 111, 181 .....	9
English Composition .....	4
Economics 51, or Agricultural Economics 53 .....	5
Civil Engineering 130 .....	6
Electives .....	6
	56

### SENIOR YEAR

Course	Credits
LA 160, 161, 162, Construction .....	9
LA 180, 181, 182, Advanced Planning and Design .....	12
LA 185, Architectural Rendering .....	3
LA 130, Recreation Planning .....	3
LA 195, Seminar .....	1
Journalism 112, Writing Feature Articles .....	3
CE 120, Roads and Pavements .....	4
English 111, Technical Writing .....	3
Electives .....	11
	49

Students interested in Environmental Planning may take additional courses in Political Science, Sociology, and Economics. Consult with staff.

## Graduate Study

**Master of Landscape Architecture.** The MLA is the professionally recognized terminal degree and constitutes two full years of graduate course study. The MLA or a Master of Science degree in Environmental Planning will be given to students who successfully meet the requirements established by the curriculum committee. Special problems in the LAEP 200 series will be assigned to students on an individual basis.

## Landscape Architecture and Environmental Planning Courses

**3. Elements of Land Planning and Design.** Relation of people to land regions and smaller areas. Principles of design and composition applied to various types of land planning. Planning the home environment and its relationship to the community is emphasized. (3F, W, Sp) **Staff**

**20. Graphics.** Methods of utilizing various graphic techniques for design presentation. Including perspective, light and shade studies, lettering, and symbolic graphics necessary for professional practice. (3F, W) **Johnson**

**30, 31, 32. Interpretive History and Design.** The history and analysis of physical plans and their various design elements as related to the community and its components. Design and planning in relation to land utilization during the past 5,000 years is studied. Emphasis on human dynamics with applications for the future. Prerequisites: LA 3, 20. (3F, 3W, 3Sp) **Bishop**

**\*35. Theory of Design.** Form and spatial relationships analyzed, defined, and applied in relation to vertical mass and horizontal. Abstract design is studied and the resultant forms transposed into spatial and mass relationships. The chief purpose is to provide the students with an awareness of design as early as possible in his training. Taught every other year. (3Sp) **Staff**

**40, 41, 42. Plant Materials.** The ecological, functional and aesthetic uses of native and cultivated wood and herbaceous plants for use on the land. (3F, 3W, 3Sp) **Wesenberg**

**60, 61, 62. Architectural Design.** The design, construction, and orientation of structures as related to land areas and architectural functions. Prerequisites: LA 20, 35. (3F, 3W, 3Sp) **Von Niederhausern**

**80, 81, 82. Applied Theory of Design and Structures.** An introduction to the principles of design relating to structures and land forms. Student design problems related to individual sites as well as overall land planning design problems. Prerequisite for all upper division LAEP courses. Prerequisites: LA 3, 20, 30, 31, 32, and 35. (3F, 3W, 3Sp) **Johnson**

**100. Professional Experience.** Prior to graduation all landscape architectural students must have completed three months experience in landscape architectural or planning position with a government or private organization. Evidence of work done and an oral or written report at the discretion of the department are required. No credit. (Su) **Staff**

**130. Park and Recreational Planning.** Analysis and development procedures in national, state and urban parks, forest lands, and private lands in terms of recreational and aesthetic values and uses. (3Sp) **Budge**

**135. Travel Course.** A major field trip to examine a variety of projects in planning and design. Students are required to take this course at least once during their training. Credit arranged. (Su) **Staff**

**140, 141, 142. Landscape Design.** Introduction to the analysis and writing of design criteria and the design procedure for private and public land planning projects. Theoretical and actual site problems are used. Prerequisites: LA 62 and Civil Eng. 82. (3F, W, Sp) **Bishop**

**150, 151, 152. Planting Design.** Pictorial compositions and planting plans developed together. Designed to develop ability in visualizing the completed landscape development. (3F, W, Sp) **Johnson**

**160, 161, 162. Landscape Construction.** Master construction plans, grading, drainage, structure, cost estimates, and specifications. (3F, W, Sp) **Baron**

**170. 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. The physical design aspects of town and city are analyzed. (3W) **Taylor**

**180, 181, 182. Advanced Planning and Design.** Urban design, subdivisions, housing projects, public grounds, parks, cemeteries, building groups, recreational areas, and communities on various types of topography. (4F, W, Sp) **Budge**

**190. Special Problems.** Selected problems to meet individual needs in completing the professional training. Registration by permission only. Credit arranged. (F, W, Sp) **Staff**

**195. Seminar.** Readings and reports on current topics and trends in LAEP. Also covers contracts, specifications, professional ethics, and office practice. (1W, 1Sp) **Taylor**

**210, 211, 212. Advanced Problems in Design and Planning.** Problems or program are outlined in a collaborative effort with the staff and candidates for the Master of Science degree. Credit arranged. (F, W, Sp) **Bishop**

**220. Thesis.** Subject matter of thesis will be determined by the student in consultation with the staff. The actual accomplishment of the thesis will be a matter of making plans and supplementary drawings necessary for the actual accomplishment of a major problem in Land Design and Development. Written ma-

\*Taught 1968-69.



terial will be required in the form of a statement of the problem; a basis of design consisting of justification, specification and any other supplementary material required.

Staff

**310, 311, 312. Landscape Architecture.** This series will cover advanced design planning construction and office procedures and practices as an integrated unit. The series is designed for students pursuing the professional MLA degree. Credit arranged. (F, W, Sp)

Taylor

**316. Professional Practice.** Graduate readings and reports on current topics and trends in Landscape Architecture and Environmental

Planning. Also covers contracts, specifications, professional ethics, and office practice. (1F, W, Sp)

Taylor

**320. Thesis.** Subject matter of terminal degree thesis will be determined by the student in consultation with the staff. The actual accomplishment of the thesis will be a matter of making plans and supplementary drawings necessary for the actual accomplishment of a major problem in Land Design and Development. Written material will be required in the form of a statement of the problem; a basis of design consisting of justification, specification and any other supplementary material required. Credit arranged.

Staff

### Department of

## Languages and Philosophy

**Head:** Professor Austin E. Fife  
Office in Main 210

**Professor Emeritus** Thelma Fogelberg; **Associate Professors** John M. Beyers, Carl T. Degener, Gordon E. Porter, David B. Richardson; **Assistant Professors** Jerry L. Benbow, John M. Lawler, Marian Robertson, Valentine Suprunowicz; **Instructors** Klara Ingold, Fabian Samaniego, Wendell W. Smith, Robert von Dassow; **Lecturer** Yvette Kepinski.

**Degree:** Bachelor of Arts (BA)

**Majors:** French, German, Spanish.

Long recognized as a necessity in cultural education, the study of languages today is also sought for its practical value in international communication. Just as scientific competence is requisite to conquering space, so proficiency in languages is requisite to understanding the peoples of the world. In recognition of this fact, the United States government currently considers language study a primary need in its national defense education policies.

The Department of Languages offers the Bachelor's degree in French, German, or Spanish and skill classes in Russian, Portuguese, Latin, and Greek. In the modern languages, emphasis is on

gaining a speaking and listening knowledge, not merely a reading knowledge. The facilities of the excellent Language Laboratory permit the student to do as much individual work in speaking and listening as he desires.

The Department enrolls large numbers of students majoring in other fields, many of whom have discovered the additional opportunities made available to them by combining the mastery of a foreign language with their major. All students planning to do graduate work should consider the study of one or two languages an essential part of their undergraduate preparation.

Courses are offered leading to the Bachelor's degree with a major in French, German or Spanish. Each of these major programs is specialized further to provide either for admission to graduate school or certification for high school teaching.

### Language Major

A) **Candidacy.** To become a candidate for a major in a modern language the student must have completed two years of lower division work in the language of his choice or the equivalent thereof through high school study or foreign residence. Proficiency tests will be used as deemed necessary by the Department of Languages to establish this equivalence.

B) **Major.** 34 upper division credits in either French, German, or Spanish plus Language 100, distributed as follows: advanced composition, conversation or linguistics; literature courses; other upper division courses in the language of the major.

Candidates for a secondary teaching credential must take French 113, German 112 or Spanish 112. They must also take Language 101, Laboratory Practice, for two of the credits listed above under "other upper division courses." They must also complete 30 credits of professional education courses including the following specific courses: Psychology 100 and 106, Public Health 155 and Education 126, 127, 129 and 130.

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.

### C) Related Fields (45 Credits).

1) One year in a second modern language, Latin or Greek is recommended.

2) Groups: Either 15 credits each in two of the three following areas or 10 credits in each; specific courses to be approved by the candidate's faculty adviser.

a) Literature courses in English or in a language other than the major; Philosophy.

b) History, Sociology, Economics, Political Science or Anthropology.

c) Fine Arts: Speech, Theatre Arts, Art, Music, Landscape Architecture.

D) **The Minor.** 1) Students majoring in a modern language will be considered to have completed their minor requirements on completion of C) above. However, under certain conditions to be ascertained by the adviser, waiver of all or part of these requirements may be granted in favor of a minor in another area.

2) For a teaching minor in a foreign language with the recommendation of the Department of Languages a student must complete 15 credits of approved upper division work in one language: 24 credits in a single language constitute a non-recommended minor for certification in the state of Utah.

**Proficiency Tests and Placement in Foreign Language Courses.** Students wishing to continue the study of a modern foreign language begun in high school or elsewhere should choose his first course as indicated below:

Experience	Course number
One year in junior high school or less .....	1
One but not more than two years in junior high or high school .....	2
Two but not more than three years in junior high school or high school .....	4/4a

Four or more years in junior high school or high school.

Proper placement will be confirmed in September by the administration of listening and reading skills tests. In cases where meaningful modern language skills have been acquired through residence abroad or through independent study, up to 15 lower division credits may be earned via special examination.

## Language Laboratory

Laboratory listening sessions are required for all lower division language classes and for some upper division classes; a fee of \$2.00 per quarter is charged for this service.

## Spring Quarter at the University of the Americas

USU offers properly qualified students the opportunity to spend Spring Quarter in residence at the University of the Americas. To qualify, students must be recommended for this program by their advisers. It should be particularly attractive to students interested in Spanish, Sociology-Anthropology, Fine Arts, Political Science, International Relations or History.

## English Courses for Foreign Students

The proficiency in English of each non-native speaker will be determined by oral interview and/or appropriate tests. Where the need is clear, they will be required to enroll in special courses designed for them prior to or concurrently with their enrollment in courses in Freshman English offered by the Department of English.

**14, 15, 16. English for Foreign Students.** Structure of the language, with exercises and drills, for increasing comprehension and ability to write accurately. Required of all foreign students who have failed to make required scores on English proficiency examinations on entering college. It may be used as an elective by others. (3F, W, Sp) **Lawler**

**30. English Phonetics for Foreign Students.** To train in the sounds of English, and to increase ability to speak with the rhythm and intonation of American English. May be taken in conjunction with Language 14, 15, 16. (3F, W, Sp) **Lawler**

## French Courses Lower Division

**1. Elementary French, 1st Quarter.** A beginner's course not open to students having had more than one year of French in junior high school or the equivalent. (5F) **Staff**

**2. Elementary French, 2nd Quarter.** A beginning course open to students having had French 1 or at least one but not more than two years of French in high school or junior high school. (5F, 5W) **Staff**

**3. Elementary French, 3rd Quarter.** Open to students having completed French 2. (5Sp) **Staff**

**4, 5, 6. Intermediate French.** Aural-oral approach with knowledge of structure development through pattern drills, conversation, and composition. Prerequisite: French 3 or at least two but no more than three years of French in junior high school and/or senior high school. (3F, 3W, 3Sp) **Fife, Kepinski**

**4a, 5a, 6a. Intermediate French Readings.** Cultural and literary readings with appropriate conversational drills and composition. Prerequisite: French 3 or two but not more than three years of French in junior or senior high school. (4a-2F, 2Sp) (5a-2W) (6a-2Sp)

**Fife, Kepinski**

## Upper Division

**103. Readings in Prose Fiction.** Reading and discussion of significant novels and short stories designed to develop vocabulary and rapid reading skills. Prerequisite: French 6 or 6a. (2F) **von Dassow**

**104, 105. Advanced Grammar, Composition and Style.** To give students of upper-division French a basic knowledge of grammar, style and composition based on contemporary models. In 104 emphasis will be on grammar; in 105 on composition and style. Prerequisite: French 6 or four years in high school. (3F, 3W) **Fogelberg**

**111. Readings in the Theatre.** Reading and discussion of selected modern plays designed to develop vocabulary and rapid reading skills. Prerequisite: French 6 or 6a. (2W) **von Dassow**

**113. Applied Linguistics, French:** Phonetics, phonemics and the teaching of pronunciation. Morphology, syntactical patterns and the theory of pattern drill. Cognates and the learning of vocabulary. Prerequisites: French 6 or 6a and Language 100. (3W) **Kepinski**

**114. Readings in Biography, Criticism, and Poetry.** Reading and discussion of modern biographical, critical or poetic works designed to prepare the student for more advanced literature courses. Prerequisite: French 6 or 6a. (2 Sp) **von Dassow**

**\*\*118. Contemporary French Civilization.** Lectures and discussion in French of the culture of France in this century. Social, political, economic and religious life and institutions. Literature, the arts, science and technology. The role of France in the modern world. Prerequisite: French 6 or 6a. (3F) **Staff**

**\*132. French Literature, 1850-1900.** Realism, naturalism, the Parnassians and symbolism. Readings, lectures and discussion of representative novelists, dramatists, poets and critics. Prerequisite: French 103, 111 or 114. (3W) **Fife**

**\*133. Romanticism in France.** Chateaubriand, Hugo, Vigny, Musset, Lamartine. Prerequisite: French 103, 111 or 114. (2Sp) **Fife**

**\*\*134. The Eighteenth Century.** Montesquieu, Voltaire, Diderot, Rousseau, Bernardin de Saint-Pierre, Prevost. Prerequisite: French 103, 111 or 114. (2W) **Fife**

**\*138. The Eighteenth Century Theatre.** Comedies of Beaumarchais and Marivaux. Prerequisite: French 103, 111 or 114. (3F) **von Dassow**

**\*\*139. The Comedies of Moliere.** Prerequisite: French 103, 111 or 114. (3F) **Fife**

**\*140. The Classical Tragedy: Corneille.** Prerequisite: French 103, 111 or 114. (2W) **Robertson**

**\*\*141. Philosophers, Moralists and Critics of the Classical Age.** Descartes, Pascal, Boileau, La Fontaine. Prerequisite: French 103, 111 or 114. (2Sp) **Fife**

**\*\*142. French Literature of the Sixteenth Century.** Humanism and the Reformation. The Pléiade, Rabelais, Montaigne and Ronsard. Prerequisite: French 103, 111 or 114. (2W) **Fife**

**\*\*143. French Literature in the Middle Ages.** Lyric, epic and didactic literature; the theatre and romances; introduction to Old French. Prerequisite: French 103, 111 or 114. (2Sp) **Fife**

**\*144. The Classical Tragedy: Racine.** Prerequisite: French 103, 111 or 114. (2F) **Fife**

**\*150. French Literature of the Twentieth Century.** Readings, lectures and discussion of representative novelists, dramatists, poets and critics. Prerequisite: French 103, 111 or 114. (3Sp) **Fife**

**196, 197, 198. Intensive Basic French.** A beginning course designed to give PhD candidates minimal reading skills. Prerequisite: Graduate standing or previous mastery of a related second language. (3F, 3W, 3Sp) **Staff**

**199. Readings and Conference.** Readings in scientific, technical or literary French. Credit arranged. Not more than 5 credits total may be earned by any student. (F, W, Sp) **Staff**

## German Courses

### Lower Division

**1. Elementary German, 1st Quarter.** A beginner's course not open to students having had more than one year of German in junior high school or the equivalent. (5F) **Staff**

**2. Elementary German, 2nd Quarter.** A beginning course open to students having had German 1 or at least one but not more than two years of German in high school or junior high school. (5F, 5W) **Staff**

**3. Elementary German, 3rd Quarter.** Open to students having completed German 2. (5Sp) **Staff**

**4, 5, 6. Intermediate German.** Intensive review of grammar. Cultural and literary readings. Prerequisite: German 3 or at least two but no more than three years of German in junior high school and/or senior high school. (3F, 3W, 3Sp) **Staff**

**4a, 5a, 6a. Second-Year Conversation.** Accompanies German 4, 5, and 6. Recommended for all students in second-year German. Prerequisite: German 3 or two but not more than three years of German in junior or senior high school. (4a-2F, 2Sp) (5a-2W) (6a-2Sp) **Staff**

**4s, 5s, 6s. Scientific German.** Intensive review of grammar. An introduction to the reading of technical German in various scientific fields. Primarily for science majors. Prerequisite: German 3. (3F, 3W, 3Sp) **Staff**

### Upper Division

**100, 101, 102. Introduction to German Literature.** Offered mainly for third-year students to bridge the gap between intermediate read-

\*Taught 1968-69

\*\*Taught 1969-70

ings and more advanced upper division literature courses. Extensive reading of selected German authors, using annotated texts. Strongly recommended for German majors. Prerequisite: German 6. (2F, 2W, 2Sp) **Staff**

**105, 106. Advanced Grammar, Composition and Style.** To give students of upper-division German a basic knowledge of grammar, style and composition based on contemporary models. In 105 emphasis will be on grammar; in 106 on composition and style. Prerequisite: German 6 or four years in high school. (3F, 3W) **Degener**

**112. Applied Linguistics: German.** Principles of language learning as applied to German. Theory and development of the concept of pattern drill. Analysis of linguistic problems encountered by teachers and students of German. Required of all teacher candidates. Prerequisite: German 105. (3Sp) **Beyers**

**116. Germany Today.** Presentation of social, cultural, economic and political aspects of post war Germany and her position in the world, combined with discussions in German. (3Sp) **Degener**

**\*120. Nineteenth Century Novelle.** Reading and discussion of representative stories by Hauff, Storm, Stifter, Keller, Meyer and others. Prerequisite: German 100 or equivalent. (3F) **Degener**

**\*121. Lessing, Plays and Biography.** Prerequisite: German 101. (3Sp) **Degener**

**\*\*122. Schiller, Plays, Poetry and Biography.** Prerequisite: German 101. (3Sp) **Beyers, Staff**

**\*\*123. Twentieth Century German Literature.** Exclusive of lyric poetry. Reading and discussion of representative stories by Schnitzler, Mann, Hesse, Kafka, Fallada and others. Prerequisite: German 100. (3Sp) **Beyers**

**\*125. The Middle Ages.** A survey of the outstanding literary works and authors of the Middle Ages. Prerequisites: German 100, 101, and 102. (3F) **Suprunowicz**

**\*\*126. Survey of German Literature.** The eighteenth century. (3W) **Degener**

**\*\*127. The Romantic Movement.** A survey of the chief literary groups, personalities, trends, and ideas of the Romantic Movement and a study of the characteristics of Romantic Literature. Prerequisite: German 102. (3F) **Beyers, Degener**

**\*\*129. Goethe's Dramas.** Goethe's dramas other than Faust I and II. Goetz von Berlichingen, Urfaust, Iphigenie, Tasso, Egmont. The influence of Goethe's life upon these works. Prerequisites: German 100, 101, and 102. (3F) **Beyers**

**\*130. Goethe's Faust—Part 1.** Prerequisite: German 129. (3Sp) **Degener, Beyers**

**\*131. Goethe's Prose.** Werther, Dichtung und Wahrheit and selections from Wilhelm Meister. Reading of a biography of Goethe. Prerequisite: German 100. (3W) **Staff**

**\*\*133. German Drama of the Nineteenth Century.** Rapid reading and discussion of representative plays from Kleist to Hauptmann. Prerequisite: German 101. (3W) **Beyers**

**\*134. German Lyrics and Ballads.** A study of the great German poets of the nineteenth and twentieth centuries including the analysis of individual poems. Goethe, Schiller, Uhland, Eichendorff, Heine, Platen, Lenau, Morike, Hebbel, Liliencron, Dehmel, Rilke, and others. (3W) **Suprunowicz**

**196, 197, 198. German for Advanced Degree Candidates.** A beginning course designed to give PhD candidates minimal reading skills. Prerequisite: Graduate standing or previous mastery of a related second language. (3F, 3W, 3Sp) **Staff**

**199. Readings and Conference.** Readings in technical, scientific, and literary German. Credit arranged. Not more than 5 credits total may be earned by any student. (F, W, Sp) **Staff**

## Greek Courses

**1, 2, 3. Elementary Greek.** (Taught only on sufficient demand.) (5F, 5W, 5Sp) **Staff**

**196, 197, 198. Greek for Advanced Degree Candidates.** This course is designed as a beginning class in Classical Greek. Emphasis is placed on mastering the basic grammar, and upon developing skills to read the simpler prose, such as excerpts from Xenophon and Herodotus. No prerequisites. (Taught only on sufficient demand.) (3F, 3W, 3Sp) **Staff**

## Latin Courses

**1, 2, 3. Elementary Latin.** Emphasizes the relation of Latin to English. Study of vocabulary and word formation as an aid to better comprehension of English. Recommended for English majors and for pre-law and pre-medical students. Includes readings from Caesar. (Taught only on sufficient demand.) (5F, 5W, 5Sp) **Staff**

**4, 5, 6. Intermediate Latin.** Readings from the orations of Cicero and Virgil's Aeneid. Miscellaneous readings from other Roman authors. Open to students who have had one year of college Latin or two years of high school Latin. (Taught only on sufficient demand.) (3F, 3W, 3Sp) **Staff**

\*Taught 1968-69

\*\*Taught 1969-70



## Language Courses (Linguistics and Teaching Methods)

**100. Introduction to Linguistics.** The nature of language and principles of language analysis. Phonetics, phonemics, morphology and syntax. Bilingualism and its psychological aspects. Relation of spoken language to systems of writing. (2W) **Fife**

**101. Language Laboratory Practice.** A course designed to give prospective teachers skill in the use of electronic, acoustical and audio-visual devices and systems as tools for learning a modern language. Prerequisite: Completion of two years' study in any modern, foreign language. (2Sp) **Samaniego**

## Portuguese Courses

**1, 2, 3. Elementary Portuguese.** Grammar, diction, conversation and reading. (Taught only on sufficient demand.) (5F, 5W, 5 Sp) **Porter**

**4, 5, 6. Intermediate Portuguese.** Grammar, reading, conversation, composition. (Taught only on sufficient demand.) (3F, 3W, 3Sp) **Porter**

**196, 197, 198. Portuguese for Advanced Degree Candidates.** A beginning course designed to give PhD candidates minimal reading skills. Admission by approval. (Taught only on sufficient demand.) (3F, 3W, 3Sp) **Porter**

**199. Readings and Conference.** Readings in scientific, technical, or literary Portuguese. Credit arranged. Not more than 5 credits total may be earned by any student. (F, W, Sp) **Porter**

## Russian Courses

**1, 2, 3. Elementary Russian.** (5F, 5W, 5Sp) **Smith**

**4, 5, 6. Intermediate Russian.** Second-year readings and grammar review. (3F, 3W, 3Sp) **Smith**

**4a, 5a, 6a. Second-Year Conversation.** Accompanies Russian 4, 5, and 6. Required for a teaching minor in Russian. Recommended for all students in second-year Russian. (2F, 2W, 2Sp) **Smith**

**196, 197, 198. Russian for Advanced Degree Candidates.** A beginning course designed to give PhD candidates minimal reading skills. Prerequisite: Graduate standing or previous mastery of a related second language. (Taught only on sufficient demand.) (3F, 3W, 3Sp) **Smith**

**199. Readings and Conference.** Readings in technical, scientific, or literary Russian. Credit arranged. Not more than 5 credits total may be earned by any student. (F, W, Sp) **Smith**

## Spanish Courses Lower Division

**1. Elementary Spanish, 1st Quarter.** A beginner's course not open to students having had more than one year of Spanish in junior high school or the equivalent. (5F) **Staff**

**2. Elementary Spanish, 2nd Quarter.** A beginning course open to students having had Spanish 1 or at least one but not more than two years of Spanish in high school or junior high school. (5F, 5W) **Staff**

**3. Elementary Spanish, 3rd Quarter.** Open to students having completed Spanish 2. (5Sp) **Staff**

**4, 5, 6. Intermediate Spanish.** Intensive review of grammar. Cultural and literary readings. Prerequisite: Spanish 3 or at least two but no more than three years of Spanish in junior high school or senior high school. (3F, 3W, 3Sp) **Staff**

**4a, 5a, 6a. Second-Year Conversation.** Accompanies Spanish 4, 5, and 6. Recommended for all students in second-year Spanish. Prerequisite: Spanish 3 or two but not more than three years of Spanish in junior or senior high school. (4a-2F, 2Sp) (5a-2W) (6a-2Sp) **Staff**

## Upper Division

**105, 106. Advanced Grammar, Composition and Style.** To give students of upper-division Spanish a basic knowledge of grammar, style, and composition based on contemporary models. In 105 emphasis will be on grammar; in 106 on composition and style. Prerequisite: Spanish 6 or four years in high school. (3F, 3W) **Fogelberg**

**\*120. Survey of Spanish-American Literature.** Literature of the Colonial period, the period of the struggle for independence, and Romanticism to 1850. Prerequisite: Spanish 116, 117 or 118 or equivalent. (3F) **Porter**

**\*121. Survey of Spanish American Literature.** Romanticism from 1850, Realism, Naturalism, Modernism. Prerequisite: Spanish 116, 117, or 118 or equivalent. (3W) **Porter**

**\*122. Survey of Spanish-American Literature.** From the Mexican Revolution to the present. Prerequisite: Spanish 116, 117, 118 or equivalent. (3Sp) **Porter**

**\*\*125. Survey of Spanish Literature.** Medieval literature and early writers of the Siglo de Oro. Prerequisite: Spanish 116 or equivalent. (3F) **Benbow**

\*Taught 1968-69

\*\*Taught 1969-70

**\*\*126. Survey of Spanish Literature.** Later writers of the Siglo de Oro through Romanticism. (3W) **Benbow**

**\*\*127. Survey of Spanish Literature.** Nineteenth Century Realism to the Spanish Civil War. (3Sp) **Benbow**

**\*128. Nineteenth Century Spanish Poetry.** A study of Spanish poetry of the nineteenth and early twentieth centuries. Prerequisite: Spanish 118 or equivalent. (3Sp) **Fogelberg**

**\*129. Cervantes. Don Quixote.** Prerequisite: Spanish 125 or permission of instructor. (3Sp) **Benbow**

**\*\*130. The Literature of the Siglo de Oro.** A study of certain writers of the Siglo de Oro: Lope de Vega, Tirso de Molina, Calderón de la Barca and others. Prerequisite: Spanish 118 or 125. (3Sp) **Staff**

**135. Modern Hispanic-American Culture.** A study of the social, political and economic conditions of Latin American countries. Prerequisite: Spanish 116 or equivalent. (3F) **Porter, Samaniego**

**\*143. The Spanish Novel Since 1849.** A study of representative writers from Realism and Naturalism. Prerequisite: Spanish 117 or permission of instructor. (3W) **Benbow**

**\*\*145. The Development of the Spanish-American Novel.** Prerequisite: Spanish 117 or permission of instructor. (3W) **Porter, Samaniego**

**196, 197, 198. Spanish for Advanced Degree Candidates.** A beginning course designed to give PhD candidates minimal reading skills. Admission by approval. (Taught only on sufficient demand.) (3F, 3W, 3Sp) **Staff**

**199. Readings and Conference.** Readings in scientific, technical or literary Spanish. Credit arranged. Not more than 5 credits total may be earned by any student. (F, W, Sp) **Staff**

## Philosophy

Before registering for upper division Philosophy the student should already have completed ten credits in related subjects in the Humanities, Literature, History, Political Science, or Sociology.

**Minor in Philosophy.** Subject to approval of their major adviser, students may have a minor in Philosophy by successfully completing eighteen credits preferably includ-

ing Beginning Logic, Ethics, and at least one course in the History of Philosophy.

## Philosophy Courses

**45. Introduction to Problems of Philosophy.** Problems of reality, thought, and value in relation to the modern world. Both for students preparing for more advanced courses in philosophy and for those desiring an introduction to philosophical terminology and to ideas of philosophers ancient, medieval, and modern who have influenced present-day thought. (5F, W, Sp) **Staff**

**50. Beginning Logic.** Signs, symbols and language in human behavior. Detection of common fallacies, ambiguity, vagueness. Structure of propositions; forms of valid inference; nature of deductive systems; recognition of formal fallacies. Framing and testing hypotheses in everyday life and in science; nature of evidence; right and wrong uses of statistics; probability, discovery of causes. (5F, W, Sp) **Staff**

**\*\*140. History of Ancient Philosophy.** The development of philosophical thought in the ancient Greek world. Emphasizes reading from the pre-Socratics, Plato, Aristotle, the Stoics, and Epicureans. (3F) **Richardson**

**\*\*141. History of Early Modern Philosophy.** European thought from the Renaissance through the eighteenth century, indicating the relationship of philosophic ideas to science, religion, and society. Readings in the metaphysics, logic, value theory, and theory of knowledge of Descartes, Hobbes, Spinoza, Leibnitz, Locke, Berkeley, Hume, and Kant. (3W) **Richardson**

**\*\*142. History of Nineteenth Century Philosophy.** European thought from Kant to Nietzsche, indicating the relationship of philosophic ideas to science, religion, and society. Readings in the metaphysics, value philosophy, logic, and theory of knowledge of such thinkers as Bentham, Mill, Comte, Hegel, Schopenhauer, Marx, and Nietzsche. (3Sp) **Beyers**

**\*143. Twentieth Century Philosophy.** Readings and discussion of major philosophies of the twentieth century, including philosophers from Bergson to Sartre. (3F) **Richardson**

**\*144. History of American Philosophy.** Treats the main American philosophical levels and systems from Jonathan Edwards to John Dewey. (3W) **Beyers**

\*Taught 1968-69

\*\*Taught 1969-70

**\*158. Philosophy East and West.** Specific influences of philosophic ideas of India, China and Japan on Western thought; parallels between a number of important East Asian philosophic ideas and corresponding ideas in Europe and America. Synthesis of Eastern and Western ideas in philosophies of the emergent Western culture of the twentieth century. (3Sp) **Richardson**

**160. Philosophy of Science.** Assumptions and implications of scientific methods and findings: law, convention, determination, causality, truth, and value in the physical, biological and social sciences. (3F) **Beyers**

**161. Symbolic Logic.** Deductive systems, valid and invalid arguments; logical paradoxes; sentential calculus and introduction to predicate calculi. (5Sp) **K. Suprunowicz**

**163. Ethics.** Introductory study of major philosophies on the nature of the good for

man, principles of evaluation, and moral knowledge. Special attention is given to appeals to reason, human nature, moral law and happiness as standards in solving moral problems. (3W) **Richardson**

**164. Aesthetics.** The philosophy of art in the principal systems of aesthetics; interpretations of the creative activity of the artist, the work of art, contemplation and criticism of art objects, and the relationship of art to the social order. (3Sp) **Richardson**

**165. Metaphysics.** Treats systematically the first causes of things. Such questions as what are the most real and the less real things. Causality, space and time, idealism versus realism, universals, matter, essence and existence; the reality of mind, its qualities and role in the cosmos; the role of God. (3Sp) **Richardson**

\*Taught 1968-69

## Department of

# Music

**Head:** Professor Max F. Dalby  
Office in Fine Arts Center 107

**Professors** Alma L. Dittmer, Irving Wassermann; **Associate Professors** Ralph Matesky, William Ramsey; **Assistant Professors** Warren Burton, Larry G. Smith, Alvin Wardle; **Lecturer** Betty Matesky; **Visiting Instructors** Eugene Foster, Stewart Grow.

**Degrees:** Bachelor of Arts (BA), Bachelor of Music (BM), Master of Arts (MA), Master of Music (MM)

**Majors:** Music Education; Applied Music; Music Theory.

The Department of Music serves three functions: 1) provides courses which meet lower division and general education requirements in Humanities and Arts; 2) provides courses to increase understanding and appreciation of music and to develop particular skills; 3) offers specific sequences of courses to students desiring professional preparation in music education, applied music, and music theory.

The general purpose of the program in music for the Music major is three-fold: 1) to prepare certified music teachers to serve effectively in vocal and instrumental music positions in public school system; 2) to prepare talented vocalists, pianists, and players of string and wind instruments for careers as professional performers and teachers; 3) to prepare gifted students for graduate study in music theory and composition.

## Music Majors

Baccalaureate degrees in music may be earned with a composite major in Music Education, Applied Music, and Music Theory. The curriculum for a major in Music Education leads to the Bachelor of Arts or the Bachelor of Music degree. The curriculum for a major in Applied Music or Theory leads to a Bachelor of Arts degree. In order for one to obtain the Bachelor of Arts degree, the foreign language requirement must be fulfilled.

Degrees offered: 1) Music Education (with instrumental or vocal concentrate); 2) Applied Music (performance) piano, voice, strings; 3) Theory.

It is assumed that each student wishing to major in Music will have had training in music prior to his entrance into the University. To ascertain his level of achievement in basic musical skills, each Freshman and transfer student who wishes to major in Music will be given an examination administered by the Music Department during orientation preceding Fall registration. This entrance test will determine whether the Music Theory sequence, typically begun Fall Quarter of the Freshman year, should be preceded by the course in Music Fundamentals and/or Group Piano Instruction. No student will be permitted to continue in Music unless he exhibits substantial powers of musical-auditory discrimination fundamental to the competency of both the performer and music educator. A comprehensive examination will be given at the discretion of the department preceding graduation at the end of the Senior year.

All Music majors are expected to attend concerts, recitals, and lyceums.

## Music Minors

### ACADEMIC

Course	Credits
Music 2 or 4 Fundamentals of Music or Beginning Theory .....	3-5
101 Music History and Literature .....	3
102 Music History and Literature .....	3
103 Music History and Literature .....	3
Ensemble Performance .....	4-6
	18

### TEACHING, ELEMENTARY SCHOOLS

Music 1 Introduction to Music .....	3
2 <sup>1</sup> Fundamentals of Music .....	3
80 <sup>1</sup> Group Piano Instruction .....	3
81 Group Vocal Instruction .....	1
150 Music for Elementary Schools .....	3
Ensemble Performance .....	5
	18

### TEACHING, SECONDARY SCHOOLS<sup>2</sup>

Music 1 Introduction to Music .....	3
2 Fundamentals of Music .....	3
81 Group Vocal and/or Individual Instruction .....	3
140 Choral Conducting .....	3
149 Gen Music in the Secondary Schools...	3
80 <sup>1</sup> Group Piano and/or Individual Instruction .....	3
Ensemble Performance .....	6
	24

## Degree in Music Education

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.

Degree in Music Education with Instrumental Concentrate:

Course	Credits
Music 4, 5, 6 Theory (beginning) .....	15
104, 105, 106 Theory (advanced) .....	9
101, 102, 103 Music History and Literature .....	9
107 Scoring and Arranging .....	3
140 Choral Conducting .....	3
141 Instrumental Conducting .....	3
151 Secondary School Choral Methods and Materials .....	3

<sup>1</sup>Other electives are permitted when proficiency is demonstrated. Music 4 (Beginning Theory) may be taken in place of Music 2.

<sup>2</sup>This program is directed primarily toward the preparation of teachers of General Music on the junior high school level.

## 276 College of Humanities and Arts

153 Secondary School Instructional Methods and Materials .....	3
80 Group Piano (or proficiency) .....	3
81 Group Voice .....	1
82 Group Woodwinds (flute, clarinet, low single reeds, double reeds) .....	4
83 Group Brass (cornet, horn, trombone, baritone-tuba) .....	4
84 Group Strings (violin-viola, cello, bass) .....	3
85 Group Percussion .....	1
Individual Instruction <sup>1</sup> .....	6
Ensemble Performance .....	6

Four recital appearances are required, one at the end of each year.

### Degree in Music Education with Vocal Concentrate

Course	Credits
Music 4, 5, 6 Theory (beginning) .....	15
104, 105, 106 Theory (advanced) .....	9
101, 102, 103 Music History and Literature .....	9
107 Scoring and Arranging .....	3
140 Choral Conducting .....	3
141 Instrumental Conducting .....	3
151-150 Second School Choral Methods and Materials and/or Elementary School Music .....	3
80-60, 160 Group Piano, Individual Piano Instruction, or proficiency .....	6
138 Readings in Choral Literature .....	3
156, 157, 158 Vocal Repertory .....	6
Individual Vocal Instruction <sup>2</sup> .....	6
Group Instrumental Instruction .....	3
Ensemble Performance .....	6

Four recital appearances are required, one at the end of each year.

### Degree in Applied Music

Applied Music majors should demonstrate outstanding competence vocally or instrumentally during their Freshman and Sophomore years. They must pass a minimum proficiency examination in piano, and should be able to sight read simple piano accompaniments. (All vocal majors are required to develop grade 4 level of piano proficiency.) Students with extensive background in piano performance may choose to pass this requirement

<sup>1</sup>Required 2 years, or competency plus 1 year on minor instrument. Participation in two major performing groups as required. In addition, Utah State Certification requirements must be met. (See College of Education.)

<sup>2</sup>Required 2 years, or competency plus 1 year.

by special examination in lieu of taking courses. All Applied Music majors are required to take weekly one-half hour private lessons during their Freshman and Sophomore years, and one-hour lessons during their Junior and Senior years. Each Applied Music major shall give an individual graduation recital during his Senior year, and each must participate in a performing organization every quarter during each year of study.

### Core

Course	Credits
Music 4, 5, 6 Theory (beginning) .....	15
104, 105, 106 Theory (advanced) .....	9
107 Scoring and Arranging .....	3
101, 102, 103 Music History and Literature .....	9
140-141 Choral or Instrumental Conducting .....	3
Foreign Language .....	24

### Vocal Major

Course	Credits
Music 156, 157, 158 Vocal Repertory .....	6
64, 164 Individual Instruction .....	12-18
Ensemble Performance .....	6
138 Readings in Choral Literature .....	3

### Piano Major

Course	Credits
Music 77, 78, 79 Piano Literature .....	6
42, 142 Piano Ensemble .....	6
155 Piano Teaching Methods .....	1
Individual Instruction .....	12-18

### String Major

Course	Credits
Music 43 String Ensemble .....	3
84 Group Strings .....	3
Individual Instruction .....	12-18
Ensemble Performance .....	6

An information manual, available from the Music Department, gives recommended sequences of courses for all applied music and music education majors for each of the four years.

### Degree in Theory

Course	Credits
Music 4, 5, 6 Theory (beginning) .....	15
104, 105, 106 Theory (advanced) .....	9
107 Scoring and Arranging .....	3



101, 102, 103 Music History and Literature	9
108, 109, 110 Counterpoint	9
114, 115, 116 Composition	9
201 Introduction to Musicology	3
Foreign Language	24
Ensemble Performance	6
Private Instruction	6
(piano and/or organ)	

It is recommended that each student in Applied Music or Theory complete 25 credits in either German or French, or 15 credits in each.

## Graduate Study

Qualified graduates from accredited degree-granting institutions in Music may be admitted as candidates for graduate degrees in Music.

Each candidate must successfully complete an examination for admission to the program of graduate study in music. This examination may be taken under the supervision of a proctor at a college or school designated by the University Department of Music and near the candidate's place of residence.

Two different degrees are offered: Master of Music and Master of Arts. The Master of Arts degree requires two years of foreign language study. For each degree, the student may select courses of study leading to a Major in Music Education or a Major in Applied Music.

Students may elect a thesis project or a lecture-recital. All work is to be completed under supervision of a graduate committee. In addition, each student is required to take the graduate record examination before being admitted to candidacy for the Master's degree.

Before being admitted as a candidate, a singer must show acquaintance with solo literature for his voice. His repertory must include:

- representative solos for his voice from standard oratorios;
- representative arias for his voice from standard operas;
- c)

standard and contemporary solo repertory from Italian, French, German, and American sources.

## Degree in Music Education

Required:	Credits
Music 258 Seminar in Music Education	3
Music 259 Seminar in Music Theory	3
Music 280 Seminar in Music Literature	3
Music 287 Individual Recital or Thesis (Music 285)	9
Educ 260 History and Philosophy of Education	3
Educ 230 Secondary School Curriculum	3
Psy 200 Principles of Learning in Teaching	3

## Minor Area

Two 3-credit upper division classes in English, History, Political Science, Sociology, or Philosophy as recommended by adviser	6
	33

### Electives:

Music 112 Twentieth Century Music	3
Music 201 Introduction to Musicology	3
Music 205 Special Problems	6
Music 251 Advanced Choral Methods	1
Music 252 Advanced Orchestra Methods	1
Music 255 Band Symposium	3
Psy 202 Psychology of Adolescence	3
Psy 205 Child Psychology and Development	3
	12
	35

## Degree in Applied Music

Required:	Credits
Music 112 Twentieth Century Music	3
Music 205 Special Problems	6
Music 258 Seminar in Music Education	3
Music 259 Seminar in Music Theory	3
Music 280 Seminar in Music Literature	3
Music 287 Individual Recital	9
Music 201 Introduction to Musicology	3
Music Individual Instruction	6
Music Performing Group Participation	3

## Minor Area

Two 3-credit upper division classes in English, History, Political Science, Sociology, or Philosophy as recommended by adviser	6
	45

## Music Courses

- 1. Introduction to Music.** A non-technical course planned to develop understanding and enjoyment of music through hearing and studying selected compositions in all musical forms. (3F, 3W, 3Sp, 3Su) **Burton, Staff**

**2. Music Fundamentals.** A study of the rudimentary materials of music: scales, intervals, keys, rhythms, meters, terminology for both visual and aural perception. Designed primarily for non-Music majors and elementary school teachers. (3F, 3W, 3Sp, 3Su) **Staff**

**4, 5, 6. Beginning Theory.** Fundamental elements of music. Includes sight singing, ear training, rhythmic reading, melody and harmonic writing and keyboard harmony. Required of Music majors. (5F, 5W, 5Sp) **Smith**

**24, 124. Chamber Orchestra.** The preparation and performance of music for chamber orchestra and opera. May be repeated for credit. Admission by audition. (1F, 1W, 1Sp, 1Su) **R. Matesky**

**25, 125. University Orchestra.** Experience in performing a wide range of orchestral works, including symphonies and major choral works. May be repeated for credit. Attendance required at all public appearances. (2F, 2W, 2Sp) **R. Matesky**

**26, 126. Varsity Band.** A training band for students who wish to qualify for membership in the University Concert Band. A band practicum providing experience for Music majors in rehearsal techniques, conducting, and playing minor instruments. Practical study of literature for use in the public schools. May be repeated for credit. (1W, 1Sp) **Smith, Wardle**

**27, 127. University Band.** Rehearsals and drills for presentation of shows for football games. Study and preparation of symphonic band literature for concert performance. Attendance required at all public appearances. Prerequisite: Ability to play a wind or percussion instrument. (Enrollment in Concert Band Winter and Spring by audition only.) May be repeated for credit. (2F, 2W, 2Sp) **Dalby, Staff**

**33, 133. University Choir.** Rehearsal and public performance of significant choral literature with emphasis on oratorio and larger forms with orchestra accompaniment. Attendance required at all public appearances. May be repeated for credit. (1F, 1W, 1Sp) **Dittmer**

**35. Opera Workshop.** Musico-dramatic techniques for the beginning singer and coach. Study of easy scenes, one-act operas and secondary roles in larger productions. Opportunity to participate in major productions. Admission by audition. (1-3Su) **Ramsey**

**42, 142. Piano Ensemble.** The study of works for two pianos and for piano, four-hands. Training in sight reading; developing ensemble playing ability. Admission by audition. Four students per section. May be repeated for credit. (1F, 1W, 1Sp) **Wassermann**

**43, 143. String Ensemble.** Offers opportunities for capable string players and pianists to form trios, quartets, and other small ensembles. May be repeated for credit. (1F, 1W, 1Sp) **R. Matesky**

**44, 144. Brass Ensemble.** Brass quartets, sextets, and larger groups. Members are selected from applicants. May be repeated for credit. (1F, 1W, 1Sp) **Wardle**

**45, 145. Woodwind Ensemble.** A study of literature for woodwind quintet and other small groups. May be repeated for credit. (1F, 1W, 1Sp) **Dalby, Smith**

**60, 160. Individual Piano Instruction.** Credit arranged. (F, W, Sp, Su) **Wassermann, Staff**

**61, 161. Individual Viola Instruction.** Credit arranged. (F, W, Sp, Su) **R. Matesky, Staff**

**62, 162. Individual Organ Instruction.** Credit arranged. (F, W, Sp, Su) **Staff**

**64, 164. Individual Vocal Instruction.** Credit arranged. (F, W, Sp, Su) **Dittmer, Ramsey, Staff**

**70, 170. Individual Woodwind Instruction.** (1F, 1W, 1Sp, 1Su) **Dalby, Foster, Smith**

**72, 172. Individual Brass Instruction.** (1F, 1W, 1Sp, 1Su) **Grow, Wardle**

**73, 173. Individual Percussion Instruction.** (1F, 1W, 1Sp) **Staff**

**74, 174. Individual Violin Instruction.** Credit arranged. (F, W, Sp, Su) **R. Matesky, Staff**

**75, 175. Individual Cello Instruction.** Credit arranged. (F, W, Sp, Su) **Burton**

**76, 176. Individual String Bass Instruction.** (1F, 1W, 1Sp) **Staff**

**77, 78, 79. Piano Literature.** A listening course designed to present piano music for the general student as well as the trained musician. Fall Quarter covers the period to and including the Baroque and Rococo; Winter Quarter, Classicism and early Romanticism; Spring Quarter, late Romanticism, twentieth century, and American music. (2F, 2W, 2Sp) **Wassermann**

**80. Group Piano Instruction.** For beginners. Music majors, Music minors, and Elementary Education majors only. (1F, 1W, 1Sp, 1Su) **Staff**

**81. Group Vocal Instruction.** (1F, 1W, 1Sp) **Ramsey, Staff**

**82. Group Woodwind Instruction.** a. flute; b. clarinet; c. low single reeds; d. double reeds. (1F, 1W, 1Sp, 1Su) **Staff**

**83. Group Brass Instruction.** a. cornet; b. trombone; c. baritone-bass; d. French horn. (1F, 1W, 1Sp, 1Su) **Wardle, Staff**

84. **Group String Instruction.** a) violin-viola; b) cello; c) bass. (1F, 1W, 1Sp) **R. Matesky**

85. **Group Percussion Instruction.** (1F, 1Su)  
**Dalby, Staff**

101, 102, 103. **Music History and Literature.** Basic course for Music majors and those desiring a comprehensive background in music. Stresses music in general culture, the place of music in history, and the relationship of music to the other arts. Fall Quarter covers the period from antiquity through the Baroque; Winter Quarter, Classicism and Romanticism; Spring Quarter, contemporary music. Required of all Music majors. Prerequisite: Music 2 or 6. (3F, 3W, 3Sp) **Wassermann**

104, 105, 106. **Advanced Theory.** Continuation of Beginning Theory. Includes advanced sight singing, keyboard modulation, and introductory counterpoint. (3F, 3W, 3Sp) **Dittmer**

107. **Scoring and Arranging.** Theoretical and practical study of scoring for wind, string, and percussion instruments in various combinations, ranging from small ensembles to the Concert Band and Symphony Orchestra. (3W) **Smith**

\*108, 109, 110. **Counterpoint.** Strict counterpoint in all species in two, three, and four or more parts. Creative writing. Combined forms: double and triple with free parts. (3F, 3W, 3Sp) **Dittmer**

112. **Twentieth Century Music.** An intensive survey of the significant techniques, forms, and styles in the music of our time. Analysis of a variety of scores and recordings. Works of criticism evaluating recent developments and statements by composers discussing their philosophy and aims are studied. Prerequisite: Music 2 or equivalent. (3Sp, 3Su)  
**Wassermann, Staff**

\*114, 115, 116. **Composition.** Projects in creative composition in the smaller forms, including solo and ensemble compositions. Prerequisites: Music 106, 107. (3F, 3W, 3Sp) **Dittmer**

\*129. **Stage Band Workshop.** Practicum for Music and Music Education majors; study of the contemporary idiom of the high school dance band; analysis of harmonic structure and ear training in chordal progressions and improvisation. Prerequisite: Music 106. (3Sp)  
**Smith**

135. **Opera Staging and Production.** Musical and theatrical techniques for the singing actor, pianist-coach, and music-theatre director. Performances of scenes, one-act operas, and at least one major production during the year. Audition required for singers and pianists. (1-3F, 1-3W, 1-3Sp, 1-3Su) **Ramsey**

136. **University Chorale.** A select mixed concert chorus performing a wide range of choral literature. Attendance required at all public appearances. Admission by audition. May be repeated for credit. (2F, 2W, 2Sp)  
**Ramsey**

138. **Readings in Choral Literature.** Provides an opportunity for majors in Music Education with the vocal concentrate to become familiar with materials suitable for performance by high school choral groups. (1F, 1W, 1Sp)  
**Ramsey**

140. **Choral Conducting.** Fundamentals of baton technique and interpretation of the musical score. Assigned projects in conducting small and large vocal ensembles. (3F) **Ramsey**

141. **Instrumental Conducting.** Basic rehearsal procedures for realization of musical values. Assigned projects in conducting small and large instrumental ensembles. (3W) **Dalby**

146. **Percussion Ensemble.** A study of literature for percussion ensemble and preparation for public performance. (1F, 1W, 1Sp) **Staff**

149. **Music for the Secondary Schools.** A study of the music program for the non-specializing teenager, dealing with his emotional and vocal problems, and with methods for introducing singing, playing musical instruments, hearing, reading, and creating music. (3Sp, 3Su)  
**Dittmer, Staff**

150. **Music for Elementary Schools.** Development of the classroom music program. Problems, methods, and materials in singing, rhythms, creative music, reading and listening. (3F, 3W, 3Sp, 3Su) **Burton**

151. **Secondary School Choral Methods and Materials.** Teaching and administration of various phases of the choral music program. (3W) **Ramsey**

153. **Secondary School Instrumental Methods and Materials.** Teaching and administration of various phases of the instrumental music program. (3Sp) **Dalby, Staff**

155. **Piano Teaching Methods.** Designed to prepare qualified pianists to teach piano effectively and to acquaint them with new materials and techniques. Problems common to all piano teaching and teacher-student relationships are analyzed. (1Sp) **Wassermann, Staff**

156, 157, 158. **Vocal Repertory.** A study of English, Italian, and French vocal literature, as well as German lied and contemporary song literature, through performance; concentration is on diction, interpretation, and style. (2F, 2W, 2Sp) **Dittmer**

163. **Piano Workshop.** An intensive course for advanced piano students and piano teachers. Includes lectures on basic harmony, piano techniques, memorization, building repertoire and teaching materials. (1Su) **Wassermann**

\*Taught 1968-69

**201. Introduction to Musicology.** A survey of the fields, systematic and historical, of musical knowledge and research. (3W) **Dittmer**

**205. Special Problems in Music.** An advanced course designed to meet specific problems of the music educator and the applied music specialist. (1-3F, 1-3W, 1-3Sp, 1-3Su) **Staff**

**235. Opera Workshop (Advanced).** Designed for the advanced singer, conductor-coach, and director. Directors will be assigned scenes and one-act operas to direct. Conductor-coaches will prepare and perform scenes and assist with major productions. Advanced singers will perform leading roles in major productions. Admission by audition. (1-3F, 1-3W, 1-3Sp, 1-3Su) **Ramsey**

**251. Advanced Choral Methods.** Rehearsal techniques and materials for the secondary school choir. The study of phonetics as it relates to choral sound. Teachers registering for this class are expected to sing in clinic chorus. Daily during Summer Music Clinic. (1Su) **Staff**

**252. Advanced Orchestra Methods.** Techniques in training the school orchestra. Consideration of special problems relating to the string instruments. Teachers registering for this class are expected to play in the clinic orchestra. Daily during Summer Music Clinic. (1Su) **Staff**

**255. Band Symposium.** An intensive review of rehearsal procedures and conducting techniques.

Survey of new materials. Analysis of performance. Wind and percussion clinics. Private consultation on special problems. Nationally known authorities serve with resident staff. Five hours daily first week of Music Clinic. (3Su) **Staff**

**258. Seminar in Music Education.** Basic concepts in Music Education. A study of musical behavior and the scientific basis for human responses to musical stimuli. (3W, 3Su) **Staff**

**259. Seminar in Music Theory.** A study of the practical aspects of musical theory is related to analysis, pedagogy and competition. (3F, 3Su) **Staff**

**280. Seminar in Music Literature.** An advanced course for graduate students. Designed to study the development of Western music from Monody to the twentieth century through analysis of its form and structure and through an investigation of all available literature. (3Sp, 3Su) **Staff**

**285. Research and Thesis.** Individual work in thesis writing with guidance and criticism. Credit arranged. (F, W, Sp, Su) **Staff**

**287. Individual Recital.** The preparation and presentation of a graduate recital. Supervision by the major professor. Credit arranged. (F, W, Sp, Su) **Staff**

## Department of

# Speech

**Head:** Professor Rex E. Robinson  
Office in Main 33

**Professor** Burrell F. Hansen; **Professor Emeritus** Chester J. Myers; **Associate Professor** Gwendella Thornley; **Assistant Professor** W. Ronald Ross; **Instructors** Gerald Allen, Farrell Black, Robert Donigan, Barbara Hales, Kristin B. Valentine; **Lecturer** Joan R. Heggen.

**Degrees;** Bachelor of Arts (BA), Bachelor of Science (BS), Master of Arts (MA), Master of Science (MS).

**Majors:** Speech, Speech—Theatre Arts Composite.

No one skill more influences personal and professional evaluation than one's ability to speak well. Professional competence and personal substantiality are sig-

nificantly obscured or disclosed by one's speech. Speech may enhance as well as betray one.

Service courses in general speech technique and practice are

offered to students at large. Prospective teachers register for courses in public speaking, oral interpretation, and story telling. "Technical and Professional Speaking" and "Discussion and Conference Leadership" are examples of classes offered for business and professional students. Individual instruction and work in the Speech and Hearing Center are available for those with particular speech problems and for those preparing for professional work in this area.

The Department offers major concentration in Interpretation, Public Address, Radio and Television Broadcasting and Clinical Speech. The student may also obtain a composite major in either Speech and English or Speech and Theatre Arts.

Major extracurricular activities for which the Speech Department has responsibility are the program in debating and related contest activities, and the annual Poetry Speaking Festival.

**Bachelor of Arts and Science Degrees.** The Department of Speech offers training in Interpretation, Public Address, and Radio and Television Broadcasting. The requirements of at least 45 credits for a **Departmental major or a teaching major** in Speech are as follows: Public Speaking, ten credits (Speech 125 and 109 or 113 required of all majors); Interpretation, ten credits (Speech 4 and 124 required of all majors); Theatre Arts, eight credits (Theatre Arts 146, 50, and 24 or 124 required of all majors); Audiology-Speech Pathology, three credits (A-SP 70, or Speech Correction for the Classroom Teacher, if available, required of all majors); Radio and Television, six credits; elective courses in Speech, eight credits. In addition, courses in Dramatic Literature, five credits, and Teaching of

Speech, three credits, are recommended in some cases. English 163 and 168 may be used for credit toward the department requirement in Dramatic Literature.

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.

If emphasizing Radio-Television, the speech major is required during his Junior and Senior years to obtain one year's broadcast experience at a commercial or educational television or radio station.

**A composite Speech-Theatre Arts major** requires the following Speech courses: Speech 1, five credits; Speech 4, five credits; Speech 124, five credits; Speech 125, five credits; Audiology-Speech Pathology 70, three credits; Speech 83, three credits; Speech 181, three credits. Those planning to certify for teaching should also take Speech 123, Teaching of Speech, three credits, although this may be taken as Education credit if desired. Students taking the Speech-Theatre Arts Composite Major may take as many as 40 credits in Speech if they desire to do so. Suggested electives for such additional hours include Speech 9, 21, 109, 110, and 113, all three-credit courses. For Theatre Arts courses needed for the Speech-Theatre Arts composite major, see the Theatre Arts Department in this catalog.

## Graduate Study

The Department of Speech offers a Master of Science degree and the Master of Arts degree in the following fields: Interpretation, Public Address and Broadcasting.



Graduate students taking speech courses in the 100 series, usually taken by upper division students, will be expected to present additional projects at the option of the instructor.

## Speech Courses

**1. Fundamentals of Speech.** Study and training in voice, body, language, meaning and personal adjustment as applied to speaking, reading, group leadership and broadcasting. (5F, W, Sp)

Thornley, Black Valentine, Hales

**3. Practice in Speaking.** For students whose experience in Freshman English or previous speech classes indicates deficiencies in such areas as adjustment to the audience situation, bodily action, varied and vigorous use of voice, oral grammar, or other aspects of speech delivery. Prerequisite: Consent of instructor. (3F, W, Sp)

Thornley

**4. Principles of Reading.** Effective oral reading. A preparatory course for understanding and appreciation of the printed page. (5F, W, Sp)

Black, Thornley, Valentine

**9. Voice and Diction Improvement.** Improvement of the vocal quality and flexibility of the normal speaking voice, development of more accurate enunciation. Diagnosis of individual problems, theory and practical exercises. Not intended for those with defects in speech cared for by the Speech and Hearing Center. (3Sp)

Valentine

**12. Individual Problems.** Individual attention given in private to needs in an effort to eliminate defects and develop skill in speech. Recommended for anyone needing individual speech instruction and for speech majors. Special fee. May be taken more than one quarter. Credit arranged. (F, W, Sp)

Staff

**16. Dialect.** The most prominent dialect works of Burns, Kipling, Drummond, Riley, Dunbar, Harris, Kirk and other writers are studied. (3Sp)

Staff

**21. Intermediate Public Speaking.** Work with types of speaking that are the most interesting and useful and determine the length of speeches and times to speak, within the framework of certain minimum requirements. Emphasizes developing skill in speech presentation. Prerequisite: Speech 1 or English 1, 2 and 3. (3F, W, Sp)

Robinson, Black, Thornley, Valentine

**81. Introduction to Radio and Television.** Radio and TV station and network organization, operations, and programming. Attention given to developing an understanding of radio and TV as factors in social organization, and to developing appreciation in selection of programs. (3F)

Hansen

**82. Radio-TV Speech.** Analysis and development of speech skills and speech forms used in radio and TV. Development of acceptable standards of voice articulation and pronunciation for broadcasting. (3W)

Hansen

**83. Radio Production.** The production of radio commercials, news, musical programs, interviews, discussions and dramas. To be taken concurrently with Journalism 8. (3Sp)

Hansen

**85. Radio-TV Operations.** Audio and video control operations for Radio and Television. Includes microphone set-ups, audio console operation, record/playback techniques, and camera operations. Two lectures and three hours laboratory per week. (3F)

Staff

**101. Parliamentary Procedure.** (1F) Robinson

**105. Technical and Professional Speaking.** Meets speech needs of technically trained and professional people. Speaking experiences such as those encountered in career situations. Prerequisite: Speech 1 or English 1, 2 and 3. (3F, W, Sp)

Robinson

**\*109. Discussion and Conference Leadership.** Application of various group discussion techniques to current problems. Workshop procedures offer practice in preparation, use and evaluation of methods. (3F)

Robinson

**\*110. Play Reading.** Attention given to cutting and building for public programs. (3Sp)

Staff

**111. Psychology and Semantics of Speech.** Principles of psychology which underlie speech. Personal adjustment through speech. An insight into the process of symbol use. (3W)

Staff

**112. Private Instruction.** Individual attention given in private to needs in an effort to eliminate defects and develop skill in speech. Recommended for anyone needing individual speech instruction and to speech majors. Special fee. May be taken more than one quarter. Credit arranged. (F, W, Sp)

Staff

**\*113. Argumentation.** Information and practice in techniques of analysis, investigation, evidence, reasoning, briefmaking, refutation and construction and delivery of the argumentative speech. (3F)

Robinson

**115. Intercollegiate Debating.** Members of debating squads may receive not more than three credits in any one year. (3F, W, Sp)

Robinson

**118. Storytelling.** Analysis and classification of typical stories with reference to periods of the child's development. Consideration is given stories of western pioneer life. Especially for the student teacher, recreation leader, church activity leader, librarian, and parent. (5F, W, Sp)

Thornley

\*Taught 1968-69

**122. Reading Poetry to Children.** The study and application of oral reading principles as applied directly to children's poetry. Also a consideration of choral reading techniques applicable to classroom situations and programming. Designed especially for teachers, prospective teachers, librarians and parents.

(3F, W, Sp)

**Thornley**

**123. Teaching of Speech.** Methods and problems peculiar to teaching of speech both in secondary schools and in speech areas for Freshman English work in the University and in basic speech courses at the college level. Organization of courses and lesson plans included. Prerequisite: Instructor's consent. (3Sp)

**Thornley**

**124. Advanced Interpretation.** The mastering of significant selections from great writers. Reading from manuscript and from memory. (5W)

**Staff**

**125. Speech Composition.** Advanced theory and practice of public speaking. Building and delivering several short speeches and reading selected masterpieces from the world's public speaking literature. Prerequisites: Junior standing and Speech 1, or English 1, 2, 3. (5Sp)

**Robinson**

**181. Television Production.** The production and direction of television programs: developing programs, casting and rehearsal procedures, and co-ordination of technical aspects. Prerequisite: Speech 83 or instructor's permission. To be taken concurrently with Journalism 184. (3F)

**Hansen**

**184. Educational Broadcasting.** Projects in developing and producing educational radio and television programs for in-school or broadcast use. Methods in effective utilization in the classroom of televised materials. (3W)

**Hansen**

**185. Advanced Radio-TV Production.** Principles and projects in television directing. Methods for meeting specialized problems in production of radio and television programs. Prerequisite: Speech 181. (3W)

**Hansen**

**186. Radio and Television Training.** Enrollment limited to students qualified by training and ability for actual broadcasting experience in a station. An apprenticeship under direction of the station staff in executing duties expected of a regular staff employee. Students render three hours' broadcasting service per week, for each hour of credit. Time and credit arranged. (Total limited to 6 credits.) (1-5F, W, Sp)

**Hansen**

**187. Television Film Techniques.** Selection and use of lenses, cameras, lighting and meters in the production of news, film, documentary footage and program film for television. Standards and methods in shooting, editing and projecting 8 and 16mm motion picture film, 35mm slides, single system sound film recording, and production of special effects are included. (3Sp)

**A. Hansen**

**190. Problems in Speech.** Selected work, individually assigned, handled and directed. Speech problems of mutual interest to student and the instructor are investigated and reported upon. Prerequisite: Instructor's consent. Credit arranged. (F, W, Sp)

**Staff**

**201. Thesis.** (2-5F, W, Sp)

**Staff**

**224. Seminar in Oral Interpretation.** (2F)

**Staff**

**\*\*225. Seminar in Rhetorical Theory.** Classical backgrounds in rhetorical theory with modifications of more recent rhetoricians. (2W)

**Robinson**

**230. Seminar in Radio and Television.** The literature and research on the uses of radio and television as media of communication and as instruments of social action. (2F, W, Sp)

**Hansen**

**290. Research Studies.** Advanced research in speech. Credit arranged. (F, W, Sp)

**Staff**

**\*\*Taught 1969-70**

Department of

## Theatre Arts

**Acting Head:** Professor Twain Tippetts  
Office in Fine Arts Center 232

**Professor** Floyd T. Morgan; **Associate Professor** Vosco Call; **Assistant Professor** Le Roy K. Brandt; **Theatre Designer** Sidney Perkes; **Artist-in-residence in dance** Marion Andersen; **Wardrobe Mistress** Elva Hatch.  
**Degrees Offered:** Bachelor of Arts (BA), Master of Arts, (MA), Master of Fine Arts (MFA).

**Majors:** Teaching major, Non-teaching major, Theatre Arts—Speech Composite.

**Career Opportunities.** Teaching theatre subjects in the secondary schools or combinations of theatre and speech or theatre and English provide the greatest number of opportunities of professional employment in education. Students who major in Theatre Arts and earn the MFA degree are qualified to teach at the college level. Several USU Theatre graduates are now performing on Broadway. Others have excellent design and technical theatre positions or are working in television or radio.

**Theatre Facilities.** The new \$2,800,000 Fine Arts Center is one of the most functional and beautiful buildings in the United States. Most of the theatre classes and activities are concentrated here. The Victorian Lyric Theatre downtown and the Sunset Amphitheatre provide other valuable places for theatre presentations.

In the New Fine Arts Center, the theatre department will make intensive use of one of the most outstanding thrust stages in the United States or Canada. There are excellent scenery shops, costume shops, dressing rooms, and a spacious dance studio. The Lyric Theatre in downtown Logan has been completely restored as an example of Victorian elegance.

For musical comedies and operas, the new 2,100 seat concert hall will also be utilized.

**Theatre Philosophy.** The Theatre Department of Utah State University emphasizes individualized instruction and concentrates on providing the maximum number of opportunities to perform or become active in the design or practical production of theatre presentations. No nationally known "Stars" are brought to take the leading roles in Utah State theatre productions and alumni are seldom used. In addition to the regular school year, a summer program of intensive professional theatre experience in a student-operated repertory company is also available.

All of the theatre and dance classes are designed to provide experience in all areas of theatre and the emphasis is on actual experience in theatre practice courses which apply what is learned in theory classes. Classes are organized in the areas of history and appreciation, a fundamentals of acting sequence, directing courses, design for theatre scenery and costume, stagecraft, lighting and sound, dramatic theory and criticism, and practical courses for drama directors and teachers.

**Financial Aid:** This year, twelve scholarships were made available to promising students in theatre. A new development fund for the arts has been established and more grants and scholarships will be made available in the years to come. Graduate assistantships are also available in Theatre Arts.

Parttime student employment on campus or in the community is available to those seriously interested in Theatre Arts. In the long history of this University, we have known no student who really wanted to major in theatre who has not been able to find sufficient employment in order to graduate. Students needing part-time employment should make this known at an early date.

## Undergraduate Study

Fifty credits are required for the teaching and non-teaching Theatre Arts major, 30 credits in Theatre Arts for the composite Theatre Arts-Speech major, 24 for the teaching minor and 18 for the non-teaching minor.

Course requirements for majors and minors are as follows:

**Teaching Major:** TH ART 24 or 124 (3 credits), 44, 46 or 144, 50, 100, 102, 104, 120, 146, 194 (27 credits); 6 credits chosen from TH ART 52, 150, 152, 154, 156; Speech 83, 125 (8 credits); electives in Theatre Arts courses (6 credits).

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.

**Non-Teaching Major:** TH ART 24 or 124 (3 credits), 20, 44, 50, 100, 102, 104, 120, 146, 160 (26 credits); 7 credits to be chosen from TH ART 52, 150, 151, 152, 153, 154, 156; Speech 83 or 181, 125 (8 credits); electives in Theatre Arts courses (6 credits).

**Composite Theatre Arts-Speech Major:** TH ART 24 or 124 (2 credits), 44, 50, 100, 102, 104, 146, 194, (22 credits); 6 credits chosen from TH ART 52, 120, 150, 152, 153, 154, 156.

For Speech courses required for the Theatre Arts-Speech Composite Major see Speech Department in this catalog.

**Teaching Minor:** TH ART 24 or 124 (2 credits), 44, 50, 10 or 100, 102 or 104, 146, 194 (13 credits); 9 credits chosen from TH ART 46 or 144, 52, 150, 152, 154, 156, 160.

**Non-Teaching Minor:** TH ART 24 or 124, (1 credit), 1 or 10, 44, 50, 146 (10 credits); electives in Theatre Arts courses (7 credits).

**Compatible Minors:** Minors in Speech, English, Art, Music, and Physical Education work well for those students majoring in Theatre Arts.

## Utah State Theatre

Each year the Utah State Theatre produces a number of plays. Theatre Arts majors are required to participate in all and Theatre Arts minors in at least two of these productions per year.

## Graduate Study

The Department of Theatre Arts offers advanced work leading to the Master of Arts and Master of Fine Arts degrees. The graduate program prepares the student for work in educational and non-professional theatres. It offers training and experience in playwriting, directing, acting, designing and advanced technical practice.

During the first quarter of residence, and before admission to candidacy for either the Master of Arts or the Master of Fine Arts degree, the candidate is required to take the Graduate Record Examination given by the School of Graduate Studies and two diagnostic examinations given by the Theatre Arts staff. The first of these Department examinations is a comprehensive written one covering theatre history, literature and criticism, acting, directing, scenery and costume design, lighting, make-up, technical practice, current drama and theatre. The second examination is an oral skills test in which

the student demonstrates before a departmental committee his competency in voice and diction, extemporaneous speaking and interpretive reading or acting. The results of these examinations are used to assist the student and his faculty adviser in planning a program of study and in selecting a thesis subject or creative project.

Candidates for the Master of Arts degree are required to present from the Department of Languages a statement of proficiency in reading one foreign language. The language should be one taught regularly at USU.

The candidate for the Master of Arts degree may, with the approval of his supervisory committee, present a thesis or a thesis alternate. The candidate for the Master of Fine Arts degree presents a creative project in playwriting, directing, acting, scene, costume, lighting, design or advanced technical practice. As part of the creative project and in lieu of a thesis, the candidate submits an original long play or its equivalent, a production book or a project portfolio.

### Fine Arts Tours

Theatre Arts majors and minors are encouraged to participate in the annual Fine Arts Tours. These include a fall tour to San Francisco and summer tours to Europe, Mexico and Hawaii. Art galleries and museums are visited, plays, musicals, ballets and operas attended. The tours are planned to give students learning experiences at minimum cost. Up to nine credits may be earned on the summer tours. Detailed information is available in the department office.

### Theatre Arts Courses

**1. Understanding Theatre.** A course planned to develop understanding of dramatic art through learning the contributions made to it by playwrights, actors, directors, designers, technicians and theatre builders.  
(3F, W, Sp)

Staff

**10. Drama Appreciation.** For the general student who wishes to enhance enjoyment of plays. Study of the major forms and styles of drama, reading and discussion of selected modern plays. (3W)

Morgan

**20. Voice for Theatre.** Development of the speaking voice in preparation for dramatic performances. Individual and group exercises for the improvement of projection, diction, flexibility and variety. (2F)

Morgan

**24. Theatre Practice.** Application of basic theatre production practices. Supervised rehearsals, performances, crew and staff work. Prerequisite: permission of Theatre Arts staff. (1F, W, Sp, Su)

Staff

**44. Fundamentals of Acting.** Theory and practice of the basic concepts of acting. (3F)

Call

**46. Intermediate Acting.** A continuation of TH ART 44, with emphasis on characterization and the development of the actor's physical, mental and emotional resources. (3W)

Call

**50. Stagecraft.** Technical organization and planning of the play production. Construction, rigging and shifting of scenery selection and building of properties. (F, W, Sp)

Brandt

**52. Make-up.** Practice of make-up for the stage. Recommended for prospective directors of school, church and community theatres. (1F)

Morgan, Perkes

**54. Children's Theatre.** Theory and practice in the selection, preparation and presentation of children's plays. Recommended for prospective elementary school teaching. (3F)

Call

**56. Puppetry.** The design, construction, and manipulation of puppets. Recommended particularly for elementary teachers. (3W)

Reynolds

**70. Beginning Ballet.** This is the beginning course in ballet for students at the University level. Students accepted by permission of the instructor. Course may be repeated a maximum of three times for credit. (1F, 1W, 1Sp)

Staff

**72. Dance for Theatre.** Body movement designed for the needs of the actor. Emphasis on the creative approach to movement as it is utilized to project character emotion and mood. (1F)

Staff

**100, 102, 104. History of Theatre and Drama.** A survey course correlating theatrical history and drama from ancient times to the present. Fall: Classic, Oriental, and Medieval; Winter: Early Renaissance through eighteenth century; Spring: nineteenth century to the present. (4F, 4W, 4Sp)

Staff

**\*\*106. Current Drama.** Reading and discussion of selected plays of modern day playwrights: O'Neill, Shaw, Anderson, Miller, Williams, Inge, Ionesco, Beckett, Albre, et. al. To be taught every other year. (5Sp)

Staff

\*\*Taught 1969-70



**120. Fundamentals of Design for the Theatre.** Basic design principles applied to designing for the theatre. Projects in sketching, rendering, drafting, perspective, model making, scene painting techniques. Prerequisite to TH ART 150, 153, 154, 192, 194 and to production thesis projects (2F) **Perkes, Morgan**

**124. Theatre Practice.** Application of basic theatre production practices. Supervised rehearsals, performances, crew and staff work, with permission of Theatre Arts staff. (1F, W, Sp, Su) **Staff**

**144. Advanced Acting.** Emphasis on the creative approach to acting, analysis and creation of the role and ensemble playing. (3Sp) **Call**

**146. Directing.** Theory and practice of the principles of stage directing. Prerequisites: TH ART 44, 50. (3Sp) **Call**

**148. Private Instruction.** Individual tutoring to develop competence in voice, acting, directing, scenic and costume design. Special fee. Credit arranged. (F, W, Sp) **Staff**

**150. Scene Design.** Application of basic principles of design to the stage setting. Development of scenic designs through color sketches, plans and models. Practice in scene painting techniques. Survey of the history of stage decoration. (3W) **Morgan**

**151. Historic Costume for the Stage.** Historical survey of the development of costume from the Egyptians to the 1900's, with a practical approach to the reproduction for stage use of each period, as well as a study of the manners of the period. (3F) **Perkes**

**152. Stage Costuming.** Fundamentals of pattern drafting, construction of stage costumes and accessories, organization and care of costume wardrobes. (2W) **Perkes**

**153. Costume Design.** Theory and practice in the design and selection of costumes for non-realistic, historical and modern plays. Relationship of costume to character and production. Registration by consent of instructor. (3Sp) **Perkes**

**154. Stage Lighting.** Study and application of the principles of stage lighting. Lighting design, mounting of instruments and operation of control boards. Prerequisite: TH ART 50 or consent of instructor. (2W) **Brandt**

**156. Theatre Organization and Management.** Study of the managerial aspects (organization, promotion, financing) of the educational and community theatres. (2Sp) **Call**

**158. Creative Dramatics.** Guidance of children in the creation of scenes and plays with improvised dialogue and action. Application of creative dramatics to the classroom situation. Recommended for prospective elementary school teachers. (2Sp) **Call**

**160. Playwriting.** Analysis of dramatic structure. (3W) **Morgan**

**166. Drama Production.** Problems of play selection, casting, acting, directing, scenery

construction and painting, lighting, costume and make-up. Recommended to drama teachers, MIA drama directors, and recreation leaders. (5W, Su) **Staff**

**170. Intermediate Ballet.** Students having completed Ballet 70 or transferring with similar Ballet experience will be permitted to enroll. While Ballet fundamentals are still emphasized, students spend more time preparing for actual performance. (1F, 1W, 1Sp) **Staff**

**171. Advanced Ballet.** Students concentrate on the actual performance of ballet compositions. Prerequisites: Ballet 70 and 170, or equivalent. (1F, 1W, 1Sp) **Staff**

**172, 173. Dance for Theatre.** Body movement designed for the needs of the actor. Emphasis on the creative approach to movement as it is utilized to project character emotion and mood. (1W, 1Sp) **Staff**

**190. Problems in Drama.** Selected research problems of merit and of mutual interest to students and instructors are investigated. Credit arranged. (F, W, Sp, Su) **Staff**

**192. Projects in Theatre.** Advanced work in playwriting, acting, directing, scene design, costume design, make-up, costume construction, lighting, technical practice, and theatre management. Projects may be done in connection with Utah State Theatre productions or they may be independent endeavors. A total of nine credits may be earned in this course. Credit arranged. (F, W, Sp, Su) **Staff**

**194. Problems of Drama Directors.** Play selection, organization of the production, drama club activities, simplification of settings, lighting, costumes, financing, auditorium and stage facilities, central staging, audio-visual aids, and bibliography are studied. Recommended for directors and prospective directors of high school, church, and community theatres. (3Sp) **Morgan**

**196. Advanced Directing.** Practice in stage direction. The student selects, casts, directs, and presents short plays and scenes. Prerequisite: TH ART 146. (3W) **Staff**

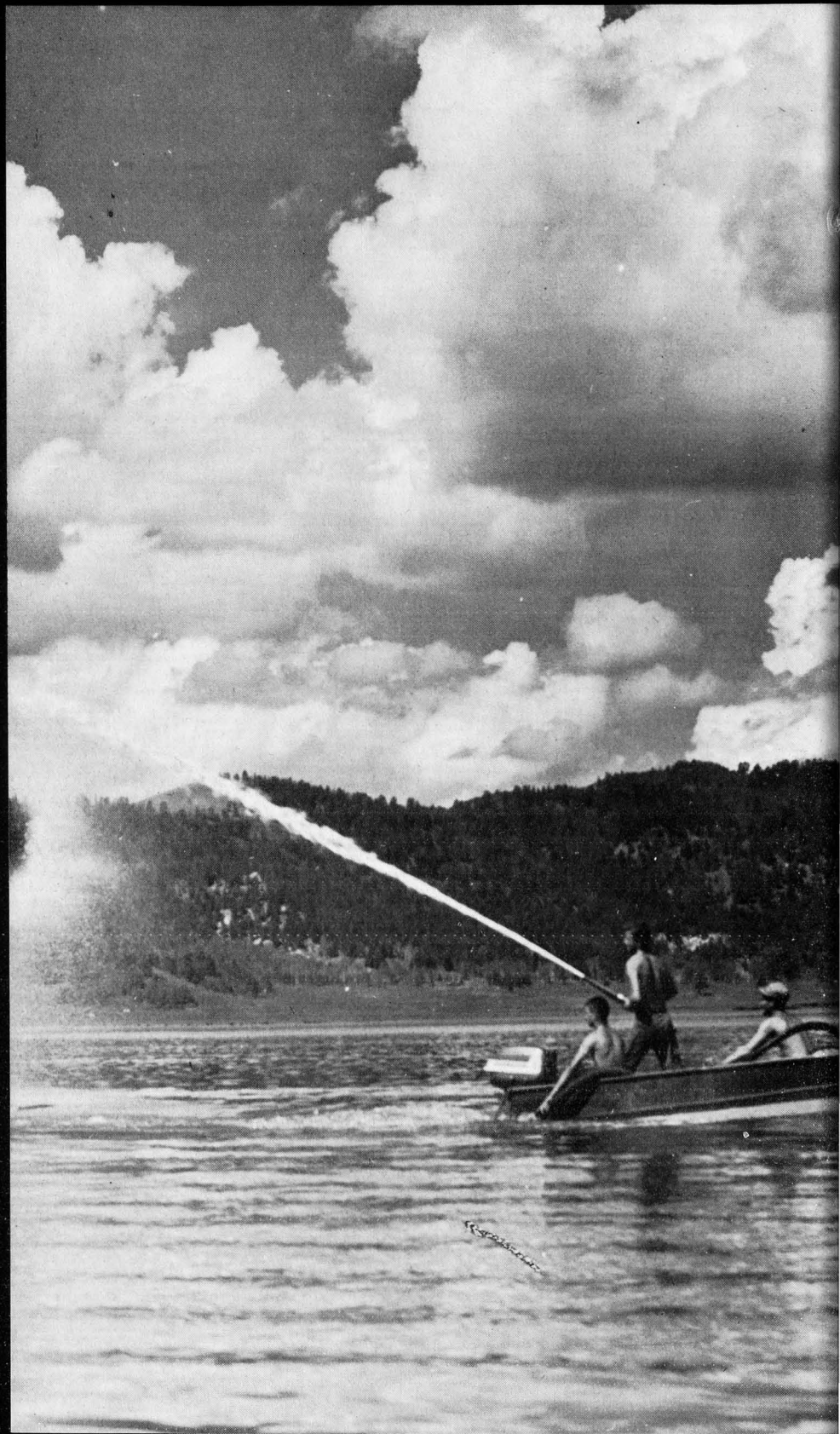
**200. Seminar in Drama.** Intensive study of special problems in drama and theatre. Credit arranged. (F, W, Sp, Su) **Staff**

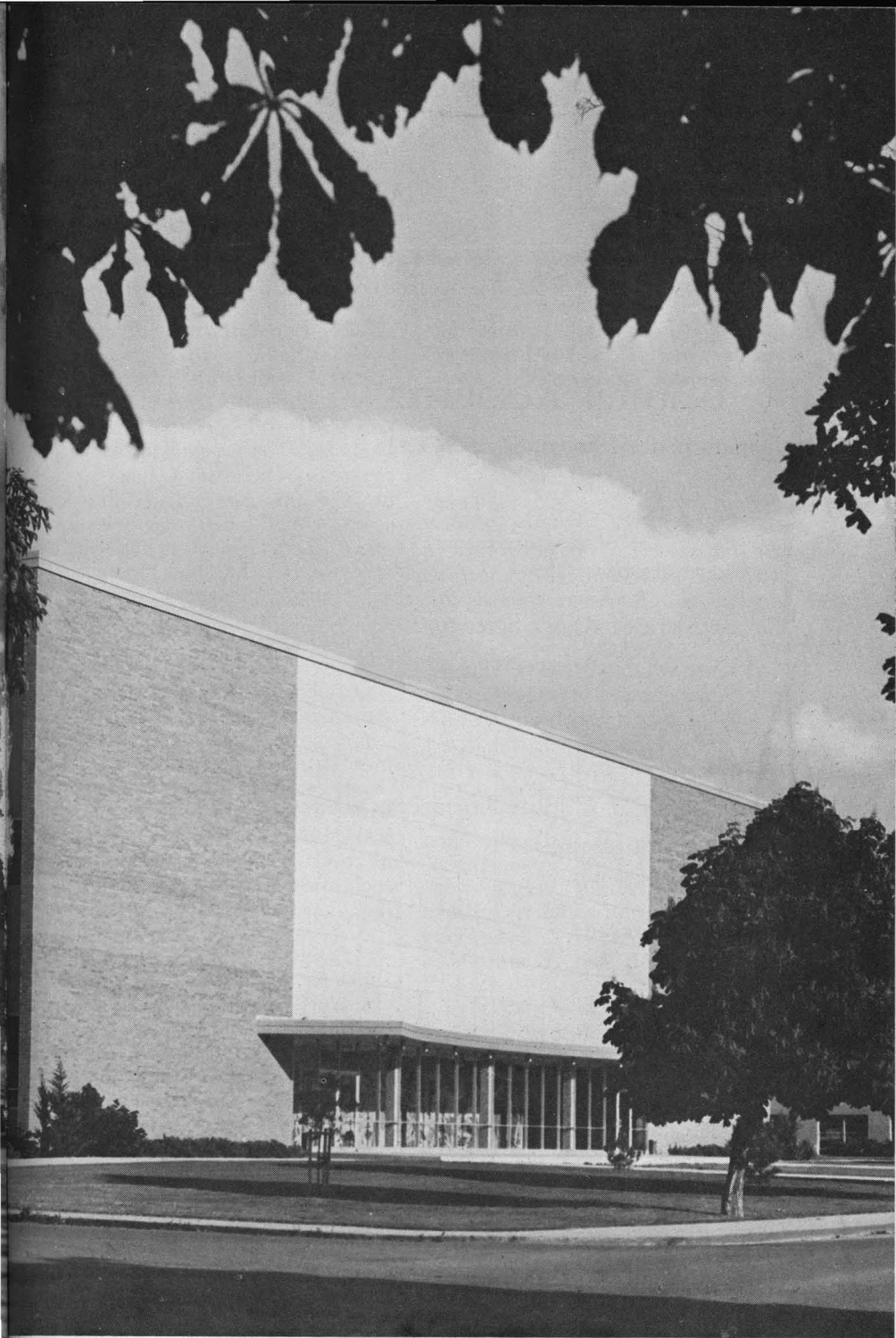
**201. Dramatic Theory and Criticism.** Beginning with Aristotle's Poetics, the course explores the traditional works of critical theory that relate to the theatrical arts. Prerequisites: TH ART 100, 102, 104. (3Sp) **Staff**

**202. Research Studies.** Advanced research in drama and theatre. Prerequisite: Permission of instructor. Credit arranged. (F, W, Sp, Su) **Staff**

**204. Thesis.** Credit arranged. (F, W, Sp, Su) **Staff**

**292. Projects in Theatre.** Graduate projects in any branch of theatre art. Credit arranged. (F, W, Sp, Su) **Staff**





*COLLEGE OF NATURAL RESOURCES*

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Natural Resources

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Master of Science

Doctor of Philosophy



*College of*

# Natural Resources

J. Whitney Floyd, **Dean**

C. Wayne Cook, **Assistant Dean in Charge of Research**

Office in Forestry and Zoology 106

Increasing activity in the fields of Forest, Range, Wildlife, Soil Conservation, Watershed Management, and Forest Recreation, and the unquestioned need for their correlation in long-range wild land management, have created excellent opportunities for men who wish to work in these fields. The purpose of this College is to provide training in the use and management of natural resources. Natural resources covers a broad field. In popular usage it connotes renewable land and water resources and their management for food, fiber, and recreation in a relatively natural setting. The forests, rangelands, wildlife resources, watersheds, and forest recreation resources comprise the natural resources in which the College has developed special professional competence. Used in this context, natural resources does not refer to minerals and cultivated land.

The favorable geographical location of this College provides exceptional facilities for field experience and affords excellent opportunities for effective training in managing wild lands and their resources. Forest and range lands in Utah comprise more than 90 per cent of the total state area. The Cache National Forest within two miles of the school, the Bear River Migratory Bird Refuge within forty miles, and vast areas of lands provide forest, range, soil conservation and wildlife problems and offer unlimited study projects and opportunities for demonstration. Herds of elk and deer are 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 this College prepares a student for positions with federal or state agencies and for private work in 1) Forest Science, 2) Range Science, and 3) Wildlife Resources. A Forest Science student may choose from four majors: one designed to train for general Forest Management work as typified by the demand of public land management agencies, one in Forest Recreation, one in Forest-Watershed Management, and one in Forest Research.

As a Range Science student you may specialize in general Range Management, Forest-Range Management, or Watershed Management. A Wildlife Resources student may select a curriculum to train either for Game Management or Fishery Management.

A student will make more satisfactory progress if he has had two years of high school algebra, geometry, and also chemistry, physics, typing and biology. Four years of English are also desirable. An interest in and an aptitude for studying natural science is important. Mere field ability is not sufficient. A prospective student should realize that Forestry and related fields are highly technical professions. They require high aptitude for scholarship and technical development. Success also is correlated with personality and ability to deal with people.



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

**Summer Camp.** Successful completion of field instruction at the College-operated Summer Camp is required of students who plan to major in any curriculum in the Forest Science Department or the Forest-Range Management option offered by the Range Science Department. Any properly qualified student in the College may attend if he desires and if he makes suitable arrangements prior to the camp period. The camp opens soon (usually the first Monday) after the end of Spring Quarter, and continues for seven weeks, unless the camp is released for fire-fighting, in which instance the camp lasts eight weeks. Nine credits are allowed for the complete program. In addition to the regular Summer Quarter fees, a \$5 fee is charged for each of the four courses. Board is provided on a cost basis; lodging is without cost. Before attending camp, one should be inoculated against Rocky Mountain spotted fever.

As a transfer to this College from another school a student should note that: 1) Completion of the camp program is required in the above-named courses of study. 2) It is prerequisite to professional Forest Science course work in the Junior year. 3) In addition to having completed two years of college work, the pattern of courses taken at another college should essentially duplicate that required of Freshmen and Sophomores in this college.

**Field trips** are planned each year as part of the regular class instruction. Besides short trips scheduled for individual courses, depart-

ments conduct an extensive field-problems trip in the Spring Quarter of the Junior year, or the Fall Quarter of the Senior year. The trip for Range Science Seniors is taken just before the Fall Quarter starts. The trip for Forest Science Juniors is taken during a period of ten days or two weeks just prior to the end of the Spring Quarter. A fee of about \$50 is charged each student to defray the transportation expenses of the trip.

**Loan Funds.** Three sources of funds are available on a loan basis to worthy, deserving upper division students in the College of Natural Resources. These are the W. B. Rice Memorial Loan Fund, the Turner Memorial Fund and the Bureau of Land Management Fund. 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. Interested high school Seniors and transfer students are encouraged to write to the Dean regarding these. See also "awards, honors, scholarships and grants-in-aid."

**Graduation Requirements.** The following general requirements must be met for graduation from the College of Natural Resources: 1) one hundred and ninety-two credits, exclusive of basic Military Science, Physical Education, and Forestry Summer Camp; 2) all courses prescribed under the study program of one's chosen field; 3) fulfillment of the General Education requirement of the University; 4) 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; 5) beginning with the 1967 grad-

uating class, Seniors in the College must have a grade point average of 2.2 in upper division courses taken in the College of Natural Resources. 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.

## Department of

# Forest Science

**Head:** Associate Professor R. S. Whaley  
Office in Forestry and Zoology 155

**Professors** T. W. Daniel, J. Whitney Floyd, Raymond R. Moore; **Associate Professor** John D. Hunt; **Associate Research Professor** J. Alan Wagar; **Assistant Professors** George E. Hart, Carl M. Johnson, Ronald M. Lanner, Richard A. Ogle, John D. Schultz; **Assistant Research Professor** Wendell Beardsley; **Collaborators** Norbert V. DeByle, Robert D. Doty, Robert S. Johnston, Richard G. Krebill, Bland Z. Richardson.

**Degrees:** Bachelor of Science (BS), Master of Science (MS), Master of Forestry (MF), Doctor of Philosophy (PhD).

**Majors:** Forest Management, Forest Recreation, Forest-Watershed Management, Forest Research

The following four programs of study are designed to give comprehensive training in all branches of Forest Science, including growing, protecting, harvesting, and utilizing timber crops. It is desirable that one know by the end of his Sophomore year in which of these four majors to enroll.

**Honors.** Any student having an accumulative grade point average of 3.2 or better may be eligible for the Department honors program. A student in the honors program may, with the approval of his major professor, substitute certain optional courses for generally required courses.

## Undergraduate Study Lower Division

In addition to the 11 Social Science and Humanities credits listed below, a student must complete an additional 14 credits in the Social Sciences and Humanities, making a total of 25 credits, with at least 10 credits in each field.

Common Freshman Curriculum for Management, Recreation and

Watershed Majors and Sophomore Curriculum for Management and Recreation Majors:

### FRESHMAN YEAR

Course	Quarters taught and Credit		
	F	W	Sp
English 1, 2, 3 .....	3	3	3
Chemistry 10, 11, 12 .....	5	5	5
Biology 15 .....	5		
Botany 26, 102 .....		5	5
Forest Science 1 .....	1		
Range Science 1 .....		1	
Wildlife Resources 1 .....			1
<sup>1</sup> Electives .....		3	
PE, MS, AS .....	1	1	1
Total .....	15	18	15

### SOPHOMORE YEAR

Course	Quarters taught and Credit		
	F	W	Sp
Forest Science 112, 113 .....	3	2	
Forest Science 134 .....	3		
Botany 120 .....			5
Math 35, 44 .....	5	3	
Physics 6, 17, or 20 .....		5	
Geology 3 .....		5	
Soils 58 .....			5
Econ 51 .....			5
<sup>1</sup> Electives .....		6	3
Total .....	16	16	18

<sup>1</sup>Social Science and Humanities credits and Restrictive Electives should be taken where electives are indicated.

Course	Summer Camp	Credit
Forest Science 96 .....		3
Forest Science 97 .....		4
Range Science 98 .....		1
Wildlife Resources 99 .....		1
Total .....		9

## Forest Management

1) The option in Forest Management provides basic training in forestry for the student who plans to go into administrative work on forest lands or into forestry research.

### Upper Division

#### JUNIOR YEAR

Course	Quarters taught and Credit		
	F	W	Sp
Forest Science 106 .....		4	
Forest Science 107 .....			3
Forest Science 114 .....		3	
Forest Science 115 .....			3
Forest Science 118 .....		3	
Forest Science 130 .....			3
Forest Science 132 .....			3
Forest Science 137 .....		3	
Forest Science 146 .....			1
Range 126 .....		5	
Range 180 .....			4
<sup>2</sup> Wildlife 150 .....		5	
<sup>1</sup> Electives .....	3	3	3
Total .....	16	17	16

#### SENIOR YEAR

Course	Quarters taught and Credit		
	F	W	Sp
<sup>3</sup> Forest Science 119 .....		3	
Forest Science 120 .....			3
Forest Science 121 .....		4	
Forest Science 122 .....			4
Forest Science 123 .....			5
Forest Science 126 .....			3
Range 162 .....			5
English .....		3	
Speech 105 .....		3	
<sup>1</sup> Electives .....	3	6	6
Total .....	16	16	16

#### 13 Credits Restricted Electives

Management students are required to take at least 13 credits of courses selected from the following list:

Course		
Forest Science 116 .....	(2)	Sp
Forest Science 125 .....	(3)	F
Forest Science 129 .....	(2)	W
Forest Science 131 .....	(3)	Sp
Forest Service 191 .....	(4)	Sp
Range 131 .....	(4)	F
Business Administration or		
Economics .....	(3)	FWSp
Applied Statistics 51 or 131 .....	(4)	FW
English 111 .....	(3)	FWSp

## Forest Recreation Option

2) The second option, Forest Recreation, is designed to provide suitable training in outdoor recreation organization, management, and supervision. In addition, a student is given sufficient forestry training to qualify for the various Federal Civil Service examinations and positions.

A Forest Recreation Research Unit was established in the College of Natural Resources in 1962. This provides additional strength to the teaching and research program in Forest Recreation.

### Upper Division

#### JUNIOR YEAR

Course	Quarters taught and Credit		
	F	W	Sp
Forest Science 106 .....		4	
Forest Science 114 .....			3
Forest Science 115 .....			3
<sup>4</sup> Forest Science 118 .....		3	
Forest Science 130 .....			3
Forest Science 132 .....			3
Forest Science 137 .....		3	
Forest Science 140 .....			3
Forest Science 146 .....			1
Range 126 .....		5	
Range 180 .....			4
Landscape Architecture 130 .....			3
<sup>5</sup> Wildlife 160 .....		5	
<sup>1</sup> Electives .....	3	3	
Total .....	16	17	16

#### SENIOR YEAR

Course	Quarters taught and Credit		
	F	W	Sp
Forest Science 120 .....		3	
Forest Science 121 .....		4	
Forest Science 122 .....			4
Forest Science 123 .....			5
Forest Science 138 .....		2	
Forest Science 139 .....			3
Range 162 .....			5
English .....		3	

<sup>1</sup>Social Science and Humanities credits and Restricted Electives should be taken where electives are indicated.

<sup>2</sup>Wildlife 145 or 160 may be substituted for Wildlife 150.

<sup>3</sup>Botany 140 and Entomology 105 may be substituted for Forestry 119.

<sup>4</sup>Forest Science 119 may be substituted for Forest Science 118.

<sup>5</sup>Wildlife 145 or 150 may be substituted for Wildlife 160.

Speech 105 .....	3		
<sup>1</sup> Electives .....	7	3	6
Total .....	17	15	16

**12 Credits Restricted Electives**

Recreation students are required to take at least 12 credits of courses selected from the following list.

Agricultural Economics 106 .....	(3)	Sp
Agricultural Economics 186 .....	(3)	Sp
Anthropology 167 .....	(3)	
Applied Statistics 131 .....	(3)	F
Applied Statistics 132 .....	(3)	W
Economics 106 .....	(3)	F
Economics 107 .....	(4)	FW
History 155 .....	(5)	W
LAEP 170 .....	(3)	W
Political Science 114 .....	(3)	Sp
Political Science 124 .....	(5)	Sp
Political Science 151 .....	(3)	F
Political Science 160 .....	(3)	FWSp
Speech 181 .....	(3)	F
Speech 185 .....	Arr	W
Sociology 154 .....	(3)	W

Forest Science 132 .....	3		
Forest Science 146 .....	1		
Forest Science 190 .....	3		
Range 126 .....	5		
Range 162 .....	5		
Range 180 .....	4		
Physics 17 or 20 .....	5		
<sup>1</sup> Electives .....	3	6	
Total .....	16	17	15

**SENIOR YEAR****Quarters taught and Credit**

Course	F	W	Sp
<sup>2</sup> Forest Science 119 .....	3		
Forest Science 121 .....	4		
Forest Science 122 .....		4	
Forest Science 123 .....			5
Forest Science 137 .....		3	
Forest Science 191 .....			4
<sup>3</sup> Wildlife 160 .....	5		
Speech 105 .....	3		
<sup>1</sup> Electives .....	3	6	7
Total .....	18	13	16

**12 Credits Restricted Electives**

Watershed students are required to take at least 12 credits of courses selected from the following list:

Soils 105 .....	(3)	F
Soils 114 .....	(5)	Sp
Soils 165 .....	(3)	F
Botany 121 .....	(3)	W
Applied Statistics 131 .....	(4)	FW
Forest Science 120 .....	(3)	W
Geology 115 .....	(5)	F
Geology 117 .....	(4)	W
Geology 134 .....	(3)	W
Civil Engineering 140 .....	(3)	F
Civil Engineering 143 .....	(4)	F
Civil Engineering 173 .....	(4)	W
Agricultural and Irrigation Engineering 149 .....	(3)	F
Agricultural and Irrigation Engineering 108 .....	(3)	F
Agricultural and Irrigation Engineering 160 .....	(3)	W
Meteorology 125 .....	(3)	W
Watershed Science 199 .....	(1-3)	WFSp

**Forest-Watershed Management Option**

3) The third option, Forest-Watershed Management provides a basic background in forestry. In addition, selected courses in watershed problems for the student and hydrology are taken. It serves as a base for the student who may undertake graduate work in forest hydrology, and it provides an improved understanding of watershed problems for the student who may enter directly into a career in forest administration.

**SOPHOMORE YEAR****Quarters taught and Credit**

Course	F	W	Sp
Forest Science 112, 113, 134 .....	3	2	3
Math 35, 46 .....	5	5	
Botany 120 .....			5
Soils 58 .....			5
Geology 3 .....	5		
Meteorology 17 .....	3		
Economics 51 .....	5		
<sup>1</sup> Electives .....	5	3	
Total .....	16	17	16

**JUNIOR YEAR****Quarters taught and Credit**

Course	F	W	Sp
Forest Science 106 .....	4		
Forest Science 114 .....	3		
Forest Science 115 .....		3	
Forest Science 125 .....	3		

**Forest Research Option**

4) The fourth option, Forest Research, is designed to provide expanded undergraduate training in the basic sciences while still providing a forestry background. It serves specifically as a stepping-

<sup>1</sup>Social Science and Humanities credits and Restricted Electives should be taken where electives are indicated.

<sup>2</sup>Forest Science 118 may be substituted for Forest Science 119.

<sup>3</sup>Wildlife 145 or 150 may be substituted for Wildlife 160.

stone to a graduate program in forestry research. Enrollment is limited to students whose previous records indicate their abilities are sufficiently high to enable them to carry a more strenuous academic load.

### Lower Division

#### FRESHMAN YEAR

	Quarters taught and Credit		
	F	W	Sp
Chemistry 20, 21, 12 .....	5	5	5
English 1, 2, 3 .....	3	3	3
Biology 15 .....	5		
Botany 26, 102 .....		5	5
<sup>1</sup> Electives .....	3	3	3
PE, MS, or AS .....	1	1	1
Total .....	17	17	17

#### SOPHOMORE YEAR

	Quarters taught and Credit		
	F	W	Sp
Botany 120 .....			5
Math 35, 46, 96 .....	5	5	5
Forest Science 112, 113 .....	3	2	
Geology 3 .....		5	
Economics 51 .....		5	
Meteorology 17 .....	3		
Soils 58 .....			5
<sup>1</sup> Electives .....	5		
Total .....	16	17	15

#### Summer Camp

Course	Credit
Forest Science 96 .....	3
Forest Science 97 .....	4
Range Science 98 .....	1
Wildlife Resources 99 .....	1
Total .....	9

### Upper Division

#### JUNIOR YEAR

	Quarters taught and Credit		
	F	W	Sp
Math 97, 98, 99 .....	5	5	5
Forest Science 106 .....		4	
Forest Science 114, 115 .....		3	3
<sup>2</sup> Forest Science 125 .....	3		
Range 126 .....	5		
Applied Statistics 131, 132 ....	4	4	
<sup>1</sup> Electives .....			7
Total .....	17	16	15

#### SENIOR YEAR

	Quarters taught and Credit		
	F	W	Sp
Physics 20, 21, 22 .....	5	5	5
Forest Science 119 .....	3		
Forest Science 121, 122, 123 ....	4	4	5
Speech 105 .....		3	
<sup>1</sup> Electives .....	5	3	6
Total .....	17	15	16

### Graduate Study

The Department offers the Master of Science and Doctor of Philosophy degrees as professional degrees. The Master of Forestry degree is offered for those students who lack prior academic training in forestry. The Master's degree is granted in the following eight subject areas: Forest Management, Silviculture, Forest Ecology, Forest Recreation, Forest Hydrology, Forest Economics, Forest Protection, and Wood Science and Technology. A thesis is required for the MS and PhD degrees, but the MF may be granted without a thesis.

The Master of Science degree in Forest Science may be earned by a student who has an undergraduate degree in Forestry, with acceptable scholarship, upon completion of a prescribed course of study and fulfillment of other requirements listed by the School of Graduate Studies.

The Master of Forestry degree may be earned by students possessing a non-Forestry Bachelor's degree with acceptable scholarship, upon completion of prescribed course of study as listed by the School of Graduate Studies catalog.

**Doctor of Philosophy degree.** A program of instruction and research leading to the degree of Doctor of Philosophy is offered to a selected number of students.

An applicant for graduate work should submit an official transcript of college courses and an official application for admittance to the Dean of the School of Graduate

<sup>1</sup>Electives must fulfill general education requirements (see Lower Division Requirements) and must include 15 additional credits of upper division (100 or higher) courses in the College of Natural Resources, as agreed upon by the student and his adviser.

<sup>2</sup>Forest Science 126 or 130 may be substituted for Forest Science 125.



Studies. Application forms may be obtained at his office.

Graduate assistantships are available to graduate students in Forest Science. Application for assistantships should be made to the Head of the Forest Science Department.

## Forest Science Courses

**1. Survey and Orientation.** Survey of the profession of Forest Management, and the relation of conservation and multiple uses of wildland resources to the welfare of the state and nation. (1F) **Hart**

**26. Wood Technology and Mechanical Properties of Wood.** For vocational education or industrial arts majors. Covers structure, identification, and mechanical properties of commercial woods of the United States. (3W) **Staff**

**96. Forest Surveying.** Practical field problems in surveying methods commonly employed in Forest, Range, and Wildlife Management. Lab fee \$5. (Summer camp 3 credits) **Moore**

**97. Forest Practice.** Field studies in inventories, successional stages, and growth of stands of trees. Study of forest soils and related land use. Lab fee \$5. (Summer camp 4 credits) **Johnson, Moore**

**103. Silviculture and Dendrology.** Basic Silvics: silvicultural systems; western conifers and western regional silviculture; elements of eastern hardwoods and types. Not open to Forest Science majors. Prerequisites: Range 126 and Summer Camp. (5W) **Johnson**

**106. Forest Measurements I.** Measurements of timber in log, tree, and stand; log rules and scaling; statistical methods useful in analyzing forest data; timber cruising practices. Prerequisite: Summer Camp. (4W) **Moore**

**107. Forest Measurements II.** Volume and yield table compilation; growth of even-aged, all-aged and residual cutover stands. Prerequisite: Forestry 106. (3Sp) **Moore**

**110. Principles of Conservation.** An introduction to conservation problems designed to acquaint one with the nature and extent of the renewable resources of the United States and the methods of conservatively using them. Open to all students except those registered in the College of Natural Resources. (3F, W, Sp, Su) **Johnson**

**112. Dendrology I. Hardwoods.** Identification, distribution and silvics of the more important forest trees in the United States. (3F) **Johnson, Schultz**

**113. Dendrology II. Conifers.** Identification, distribution, and silvics of the more important forest trees of the United States. (2W) **Johnson, Schultz**

**114. Silviculture I.** Characteristics of the tree species which influence silvicultural practice in the United States. Prerequisites: Summer Camp, Range 126, Forestry 112, Botany 120. (3W) **Daniel**

**115. Silviculture II.** Silvicultural systems used in securing natural reproduction of forests and their applications to the important species and forest types in the United States. Prerequisite: Forestry 114. (3Sp) **Daniel**

**116. Seeding and Planting.** Seed collection, extraction and cleaning methods; germination testing; storage of forest tree seeds; practical experience in field planting and nursery work. Prerequisite: Forestry 115. (2Sp) **Daniel**

**118. Forest Protection I.** Prevention, suppression and suppression of forest and range fires, including economic and physical effect; fire behavior. Field trips. (3W) **Hart**

**119. Forest Protection II.** Problems of administration and economics in protecting forests from biological enemies. Prerequisites: Forestry 115, 121. (3W) **Lanner**

**120. Silviculture III.** Regional silviculture of the United States. Prerequisite: Forestry 115. (3W) **Daniel**

**121. Forest Management.** Physical factors influencing the regulation of a forest for sustained yield: site, growing stock and rotation; compilation of data for management plans. Prerequisites: Forestry 107, 115. (4F) **Moore**

**122. Forest Valuation.** Determination of monetary values in forest growing stock and land. Analysis of alternate management methods by use of standard valuation techniques. Prerequisite: Forestry 121. (4W) **Moore**

**123. Forest Economics.** Economic problems involved in the utilization of forest land and timber, distribution of forest products, and the management for multiple uses. (5Sp) **Whaley**

**125. Logging.** Principles and methods of harvesting wood products, with emphasis on cost, values, and the application of forestry to the harvesting process. Prerequisite: Forestry 97. (3F) **Moore**

**126. Wood Technology.** Structure and identification of the economic woods of the United States. Prerequisites: Forestry 112, 113. (3W) **Staff**

**129. Mechanical Properties.** Factors affecting the strength of wood. (2W) **Staff**

**130. Milling and Products.** Manufacturing, grading, seasoning and preserving lumber, including study of the wood-using industries and their products. (3Sp) **Staff**

**131. Forest Products Marketing.** Principles of marketing applied to lumber and other forest products. (3Sp) **Staff**

132. **Forest Administration and Policy.** A study of forest administration, organization, policy formation and personnel management. The development of forest and conservation policy and its effects on current forestry practices. (3Sp) **Ogle**
134. **Aerial Photo Interpretation.** Elements of photogrammetry; use of aerial photographs in mapping vegetation types and estimating timber volumes, construction of planimetric maps from aerial photographs. (3F, W) **Ogle**
137. **Recreational Use of Wildland.** Consideration of the factors responsible for recreational use, legislative programs, philosophical concepts, and descriptions of recreation agencies involved in wildland recreation management. (3F) **Ogle**
138. **Regional Recreation Planning.** Land classification and economics of various forms of forest recreational use. (2Sp) **Whaley**
139. **Interpretive Planning.** The analysis and development of interpretive programs for recreational areas. Techniques of natural history interpretation. Evaluation and planning of visitor information programs. (3W) **Hunt**
140. **Forest Recreation Management.** Factors influencing the management of forest recreation sites. Consideration of land management objectives, alternative methods of development, regulations, and user satisfaction. (3Sp) **Floyd, Hunt**
145. **Forest Problems.** Individual study and research upon a selected forestry problem approved by the instructor. (1-3F,W,Sp) **Staff**
146. **Junior Field Problems.** Study of forest operations. Junior year. Fee \$50. (1Sp) **Staff**
190. **Watershed Instrumentation.** Application of data collection devices and systems to measurements of wildland watershed parameters. Includes experience in installation and operation of hydro-meteorologic equipment and discussion of techniques for interpretation and analysis of data. Prerequisite: Range Science 180 or permission of instructor, 2 lectures, one lab. (3Sp) **Hart, Schultz**
191. **Forest and Range Hydrology.** The role of forest and range vegetation in determining the hydrologic function of a watershed; natural storage phenomena of the forest land surface and methods of modifying this. Prerequisites: Range 126, 180, Forestry 115. (4Sp) **Hart, Schultz**
201. **Forest Management Seminar.** Review and discussion of current literature and developments in Forest Management. (1F) **Moore**
202. **Forest Watershed Seminar.** Review and discussion of current literature and developments in Forest Watershed Management. (1W) **Schultz**
203. **Forest Recreation Seminar.** Review and discussion of current literature and developments in Forest Recreation. (1Sp) **Staff**
204. **Forest Ecology.** Study of past and present distribution of forest species and forest types and the physical-biological basis of distribution and growth performance. (3W) **Staff**
205. **Silviculture.** Intensive study of a particular region by individual students. Group work consists of advanced treatment of silvies and silviculture, with emphasis on physiological aspects of both subjects. (3F, W, Sp) **Daniel**
206. **Forest Management.** Individual study projects within the fields of forest measurements, valuation, regulation, organization, and development of forest properties. (2F, W, Sp) **Moore**
207. **Forest Protection.** Advanced study in specialized fields of forest protection. (2W) **Staff**
208. **Forest Watershed Management.** Individual study projects within the field of forest watershed management. (2F, W, Sp) **Schultz**
209. **Forest Economics.** Advanced work in forest economics. Particular attention is given to the application of economic theory to solving present-day problems in the multiple use of forest lands and in the production and distribution of forest products. (2F, W, Sp) **Whaley**
210. **Forest Recreation.** Individual study projects within the field of forest recreation. (2F, W, Sp) **Staff**
211. **Thesis.** Original research on a problem in Forest Management, to be concluded by preparation of a thesis. (10-15F, W, Sp) **Staff**
212. **Forest Utilization.** Individual study projects within the field of forest utilization. (2F, W, Sp) **Staff**
213. **Forest Ecology Problems.** Individual problem work in specialized aspects of forest ecology. (2F, W, Sp) **Daniel, Lanner, Schultz**
215. **Tree Improvement and Forest Genetics.** Forest tree improvements through selective breeding and testing. Course includes study of the techniques and problems of applying the principles of genetics to forest trees. Prerequisite: Zoology 112. **Lanner**
220. **Advanced Forest Autecology.** Advanced treatment of the effects of various environmental factors on tree development, and consideration of the consequent reverse action of the tree itself on the environment. (3W) **Schultz**

221. **Advanced Forest Synecology.** Advanced treatment of the community relations of forest stands, their internal structure, and their effect on the surrounding environment. (3W) **Staff**

222. **Forest Ecosystem Analysis.** Detailed investigation of the autecology and synecology of selected forest ecosystems; interpretation of the dynamics of the ecosystem. (3Sp) **Daniel**

## Department of

# Range Science

**Head:** Professor L. A. Stoddart  
Office in Forestry and Zoology 161

**Professors** C. Wayne Cook, Karl G. Parker, Arthur D. Smith; **Assistant Professors** James E. Bowns, Martin M. Caldwell, George B. Coltharp, J. B. Grumbles, Jack F. Hooper, George W. Scotter, Neil E. West; **Collaborators** Donald M. Beal, Alvin T. Bleak, Raymond W. Brown, Paul W. Conrad, Gerald Frederic Gifford, William A. Laycock, P. E. Packer.

**Degrees:** Bachelor of Science (BS), Master of Science (MS), Doctor of Philosophy (PhD).

**Majors:** General Range Science, Forest Range Science, Range Watershed Management, Range Economics and Appraisal.

Graduates are qualified for such positions as Forest Ranger, Soil Conservationist, Range Manager, or Range Conservationist, under the United States Civil Service Commission, with such federal agencies as the Forest Service, Soil Conservation Service, Bureau of Indian Affairs, and Bureau of Land Management. At present a shortage exists in qualified men for such positions, and employment opportunities are excellent. State land management and both federal and state research opportunities are also available.

Range Science graduates also may enter private work, such as operating a livestock ranch, technical foreman for livestock companies, adviser to land management companies, and range land appraiser.

## Undergraduate Study Lower Division

Students in the Department of Range Science must complete the

course work listed below during the Freshman and Sophomore years. In addition, University group requirements and course work under one of the four fields of specialization.

### FRESHMAN YEAR

#### Quarter taught and Credit

Course	F	W	S	P
Biology 15 .....	5			
Botany 26, 102 .....		5	5	
English 1, 2, 3 .....	3	3	3	
<sup>1</sup> Math 34, 35, 44 .....	3	5	3	
<sup>2</sup> Meteorology 17 .....			3	
Forest Science 1 .....	1			
Range Science 1 .....		1		
Wildlife 1 .....			1	
<sup>3</sup> Animal Science 2 .....	2			
<sup>4</sup> Physical Education .....	1			
Group Requirements .....		3	5	
Total .....	15	17	20	

<sup>1</sup>Students presenting 1½ credits of high school algebra or otherwise qualified to take college algebra (Math 35) are not required to take Math 34. High school geometry is prerequisite to Math 34, 35, 44.

<sup>2</sup>Required for Watershed Management.

<sup>3</sup>Not required of students with experience in judging livestock, or in Watershed Management.

## SOPHOMORE YEAR

Course	Quarter taught and Credit		
	F	W	Sp
Chemistry 10, 11, 12 .....	5	5	5
Soils and Meteorology 58 .....			5
Economics 51 .....			5
Geology 3 .....			5
<sup>4</sup> Physical Education .....	1		1
Math 60, 66 .....		3	3
<sup>5</sup> Group Requirements .....	5	6	5
Total .....	16	19	19

## General Range Science Major

### Upper Division

General Range Science is the program under which the student is trained for management of range lands, including public range administration and private ranch operation.

## JUNIOR YEAR

Course	Quarter taught and Credit		
	F	W	Sp
Physics 6 .....			5
Range Science 160 .....			5
Range Science 161 .....			1
Range Science 126 .....			5
Botany 120 .....			5
Range Science 131, 130, 132 .....	4	3	3
Range Science 163 .....			3
English 112 .....			3
Animal Science 150, 151, 152 .....	3	3	3
Total .....	18	14	14

## SENIOR YEAR

Course	Quarter taught and Credit		
	F	W	Sp
Wildlife 160 .....			5
Watershed 180 .....			4
Range Science 196 .....			3
Range Science 193 or 194 .....			2or2
Animal Science 110 .....			3
Animal Science 125 .....			3
Range Science 181 .....			3
Range Science 164 .....			3
Total .....	14	9	5

## Forest-Range Option

Forest-Range Science is the program which trains the student for work in the U.S. Forest Service.

<sup>4</sup>Not required for those having served with the Armed Forces. Military Science or Aerospace Studies courses may be substituted. See Physical Education Department write-up regarding specific course work required.

<sup>5</sup>Range Economics and appraisal only.

## JUNIOR YEAR

Course	Quarter taught and Credit		
	F	W	Sp
Physics 6 .....			5
Range Science 160 .....			5
Range Science 126 .....			5
Botany 120 .....			5
Range Science 131, 130, 132 .....	4	3	3
Range Science 163 .....			3
English 112 .....			3
Forest Science 118 .....			3
Forest Science 125 .....			3
Forest Science 132 .....			3
Total .....	17	14	14

## SENIOR YEAR

Course	Quarter taught and Credit		
	F	W	Sp
Wildlife 160 .....			5
Range Science 196 .....			3
Range Science 193 or 194 .....			2or2
Range Science 164 .....			3
Forest Science 106 .....			4
Forest Science 134 .....			3
Forest Science 103 .....			5
Forest Science 123 .....			5
Total .....	11	14	7

## Range Watershed Management Option

Range Watershed Management involves training in wild-land hydrology, soil conservation, and administration of watersheds.

## JUNIOR YEAR

Course	Quarter taught and Credit		
	F	W	Sp
Physics 6 .....			5
Range Science 160 .....			5
Range Science 161 .....			1
Range Science 126 .....			5
Range Science 131, 132 .....	4		3
Range Science 163 .....			3
English 112 or 111 .....			3
Geology 115 .....			5
Watershed Science 180 .....			4
Watershed Science 190 .....			3
Electives .....			3 3
Total .....	15	15	17

## SENIOR YEAR

Course	Quarter taught and Credit		
	F	W	Sp
Applied Statistics 51 .....			4
Soils 114 .....			5
Range Science 196 .....			3
Range Science 193 or 194 .....			2or2
Range Science 164 .....			3
Wildlife 160 or 145 .....			5
Watershed Science 191 .....			4
Watershed Science 198 .....			1
Electives .....			5 10 6
Total .....	17	16	17

## Range Economics and Appraisal Option

Range Economics and Appraisal is the program for men interested in federal work in land classification and range economics or in private ranch management and real estate appraisal.

### JUNIOR YEAR

#### Quarter taught and Credit

Course	F	W	Sp
Physics 6 .....			5
Range Science 160 .....	5		
Range Science 161 .....	2		
Range Science 126 .....			5
Botany 120 .....		5	
Range Science 131, 130, 132 .....	4	3	3
Range Science 163 .....		3	
English 112 .....			3
Range Science 181 .....		3	
Group Requirements .....	3	3	
Total .....	17	14	16

### SENIOR YEAR

#### Quarter taught and Credit

Course	F	W	Sp
Accounting 100 .....	4		
Agricultural Economics 102 .....	3		
Business Administration 131 .....	3		
Business Administration 132 .....		3	
Range Science 164 .....		3	
Range Science 170 .....			3
Range Science 180 .....		4	
Range Science 193 .....		2	
Range Science 196 .....		3	
Wildlife 160 .....		5	
Economics 107 .....		3	
Economics 108 .....			3
Total .....	18	15	6

## Range Science Minor

The following courses in Range Science are suggested for students who wish to minor in this field (requirements subject to approval by the Range Department): Range 126, Plant Ecology; Range 160, Principles of Managing Range Land; Range 161, Range Analysis Techniques; Range 130, 131, 132, Range Plant Communities; Range 181, Range Economics.

## Graduate Study

The Master of Science degree and the Doctor of Philosophy degree are offered in Range Science and related fields such as plant ecology, water-

shed management, range economics, and game-range management. The program of instruction and research leading to these degrees is available only to students meeting high scholastic standards and who are accepted by the department staff. Students desiring entrance to these graduate programs should contact the department head for information concerning eligibility.

Cooperation with other departments and research centers of the University and with government collaborators permits strong graduate programs in all phases of range-related sciences. Particular mention should be made of the University's Ecology Center, in which the Range Department is very active; the Utah Agricultural Experiment Station, which has a full program in both applied and basic range research; the Center for Water Resources Research, sponsoring range watershed research; the cooperative Utah State Fish and Game Department program in big game-range research, and the Forest and Range Experiment Station, which maintains a research center on the campus for range and watershed research.

There are available to graduate students a number of assistantships and fellowships which will defray most of the costs of attending school, including exemption from non-resident tuition fees. The department qualifies under the National Defense Education Act, University Fellowship, and National Science Foundation programs. Teaching assistantships and research assistantships, which are attached to existing faculty research programs, involve parttime work for the Department.

Students interested in financial aid for graduate training should write to the department head for details early in the school year preceding initiation of graduate work.



## Range Science Courses

**1. Elements of Range Science.** Introduction to problems and methods in range science. (1W) **Stoddart**

**98. Range Analysis.** Field identification of summer range plants. Methods and techniques of vegetation analysis. Practice in range allotment analysis. (1 Summer Camp)

**Grumbles**

**126. Plant Ecology.** Role of heredity and environment in plant behavior; plant succession, competition and indicators; analysis of habitat factors influencing plant growth and distribution. Prerequisites: Plant Taxonomy and General Soils. Lab fee \$1. (5F, Sp)

**Stoddart**

**130. Grassland Communities.** Composition, distribution, successional patterns, and management of grassland ranges. Prerequisites: Plant Taxonomy and Range 131. Two lectures, one lab. (3W)

**Grumbles**

**131. Forest Range Communities.** Composition, distribution, successional patterns, and management of forested ranges. Prerequisite: Plant Taxonomy. Two lectures, two labs. (4F)

**West**

**132. Desert Plant Communities.** Composition, distribution, successional patterns and management of desert ranges. Prerequisites: Plant Taxonomy and Range 131. Lab fee \$10. Two lectures, one lab. Saturday field trips may be scheduled. (3Sp)

**West**

**160. Applied Range Science.** An introductory course in range science. Range 161 must be taken concurrently. (5F)

**Cook**

**161. Range Analysis Techniques.** Theory, application and limitations of vegetation analysis methods and techniques. Field practice in vegetation sampling and range analysis. Credit not allowed those with credit in Range 98. Lab fee \$3. Field trips to be arranged. (2F)

**Grumbles**

**162. Range Management.** A terminal course for non-Range majors dealing with management of native range lands, maintenance of production, utilization of range forage, and management of range livestock. Forest Science 146 must not be taken concurrently. Prerequisite: Summer Camp or permission from instructor. (5Sp)

**Grumbles**

**163. Range Improvement.** Methods and problems involved in seeding range lands, removing brush, improving stock watering facilities, and fencing ranges. Terracing, water spreading and use of dams on range lands. Prerequisite: Range 160 or 162. (3W)

**Grumbles**

**164. Technical Problems in Range Management.** Specialized problems in range administration and science encountered by the technician. Prerequisite: Range 160 or 162. (3W)

**Stoddart**

**170. Range Land Appraisal.** Principles of appraising land with special reference to ranges. Prerequisite: Range Economics or equivalent. (3Sp)

**Hooper**

**180. Watershed Management.** Principles and methods involved in managing range and forest lands for optimum production and regulation of water yields and for maintaining soil stability. Three lectures, one lab. Lab fee \$4. Saturday field trips may be scheduled. Prerequisite: Range 126. (4W)

**Coltharp**

**181. Range Economics.** Development of the range industry, cost of production, range land utilization, organization of cattle and sheep industry, and value of range forage. Prerequisite: Range 160 or 162. (3F)

**Hooper**

**193. Range Seminar.** Supervised discussion and review of range animal literature. Prerequisite: Senior classification. (2W)

**Hooper**

**194. Range Seminar.** Supervised discussion and review of range plant literature. Prerequisite: Senior classification. (2Sp)

**Coltharp**

**195. Range Problems.** Individual study and research upon selected problems in Range Science and related subjects. Prerequisite: Faculty approval. (1-3F, W, Sp, Su)

**Staff**

**196, 197. Range Field Problems.** Field study of range management operations and research. Courses 196 and 197 are given alternate years. Lab fee \$50. Prerequisite: Plant Ecology and Plant Communities. (3F)

**Hooper**

**200. Range Thesis.** Original research and study on a problem in Range Science. (1-15F, W, Sp, Su)

**Staff**

**202. Readings and Conference.** Selected readings in Range Science and related subjects. (1-3F, W, Sp, Su)

**Staff**

**204. Land Use Seminar.** Current problems and practices in land resource allocations and administration with special emphasis on the western range. (2F)

**Hooper**

**\*205 Seminar in Range Nutrition.** Problems in research in the field of plant and animal nutrition on rangeland. Prerequisite: Animal Nutrition. (3W)

**Cook**

**\*\*206. Research Methods.** A study of research methods in range science and related subjects. Prerequisite: Statistics. (3W)

**Cook**

**207. Graduate Seminar.** Review of current research in range science by graduate students and faculty. (1Sp)

**Gifford**

\*Taught 1968-69

\*\*Taught 1969-70

**\*210. Plant Autecology.** Advanced study of effects of factors of the environmental complex upon native plants. Prerequisites: Plant Ecology and Plant Physiology. Two lectures, one lab. (3W) **Caldwell**

**\*\*211. Plant Synecology.** Development, structure, and classification of native vegetation. Prerequisite: Plant Ecology. Statistics suggested. (3W) **West**

**\*215. Plant Geography.** The distribution of native vegetation of the world in relation to environment. Offered alternate years. Prerequisites: Range 126 and 211. (3W) **West**

**\*221. Plant Ecophysiology.** Advanced study of the integration of plant ecology and phys-

iology in analyzing response of native plant species to their environments. Offered alternate years. Prerequisites: Range 126 and Botany 120. (3Sp) **Caldwell**

**\*280. Watershed Analysis.** Advanced study of principles, technical problems, and procedure encountered in managing watersheds. Prerequisite: Range 180. (2Sp) **Gifford**

**\*281. Advanced Range Economics.** Advanced study of economic factors affecting land management practices with special consideration to range lands and range operations. Prerequisite: Range Economics. (2Sp) **Hooper**

\*Taught 1968-69

\*\*Taught 1969-70

## Department of

# Wildlife Resources

**Head: Professor William F. Sigler**  
Office in Forestry and Zoology 163

**Professors** George H. Kelker, Jessop B. Low, John M. Neuhold, Allen W. Stokes, Frederic H. Wagner; **Associate Professors** William T. Helm; **Assistant Professors** David F. Balph, Robert H. Kramer, Clair B. Stalnaker, Gar W. Workman; **Collaborators** Wayne Bohl, Ron Goede, Don Hawthorne; **Research Chemist** Susan S. Martin; **Teaching Assistants** Dale Bremer, William Franklin.

**Degrees:** Bachelor of Science (BS), Master of Science (MS), Doctor of Philosophy (PhD).

**Majors:** Wildlife Resources, Fishery Biology, Wildlife Biology, Fishery Management, Wildlife Management, Limnology, Animal Ecology, Fishery Biology, Wildlife Biology, Animal Behavior.

Of foremost importance is the belief and philosophy of the Department of Wildlife Resources that our natural, renewable resources are produced to be used, in a manner consistent with their conservation and perpetuation.

Wildlife Resources graduates are employed in private industry, including fish hatcheries and game farm management. They also find employment as biology teachers and scout executives. Graduates from all curricula of the college are finding increasingly good professional opportunities in research positions.

The department participates in a Cooperative Wildlife Research

Unit, a Cooperative Fishery Unit, and a program in wildlife extension.

The department operates or has access to the following research facilities: a large new aquarium facility operated as an aquatic toxicology and physiology laboratory, the Bear Lake Biological Laboratory, a new experimental fish hatchery, a river studies laboratory area, and a radioecology and behavior laboratory.

## Undergraduate Study Lower Division

The first two years include courses designed to give the student a sound scientific background. By the beginning of the Junior year

one should decide with his adviser upon a course of studies for the final two years. Besides choosing an option, a student will want to select courses to meet his particular professional goal.

During the Freshman and Sophomore years a student should complete the following:

English 1, 2, 3 .....	9
College Algebra and Trigonometry .....	8
Chemistry, including Organic .....	15
Biology .....	5
Botany, including Taxonomy .....	10
Zoology: Invertebrate, Vertebrate and Entomology .....	10
Physics .....	5
Economics .....	5
Soils .....	5
Survey courses in Forest, Range, and Wildlife Management .....	4
MS, AS, or PE .....	3

Students wishing to prepare themselves for graduate work should take Math 96, 97 and 98 in addition to Algebra and Trigonometry; Chemistry 20, 21, 22; Physics 17, 18, 19; and Applied Statistics 131, 132 in place of Applied Statistics 51.

Electives from associated departments are chosen with approval of the major professor. Recommended electives include: all courses in Wildlife, Range or Forest Science; Applied Statistics 131, 132, 141; Botany 112; Chemistry: Organic, Physical, or Biochemistry; Civil Engineering 81, 173; Animal Science 150; Geology 3; Photography 51; Physical Education 36; Physiology 4, 121, 122, 130; Zoology 101, 112, 116, 118, 119, 121, 122, 128, 129.

### Required of All Wildlife Students for Graduation

Wildlife 145, Principles of Wildlife Management .....	3
Wildlife 160, Animal Ecology .....	5
Range 126, Plant Ecology .....	5
Applied Statistics 51 or 131, Statistical Methods .....	4
English 111, 112, Advanced Writing .....	6
Speech 105, Technical Speaking .....	3

Social Sciences and Humanities (including above required courses), 25 credits with at least 10 in each group. In addition to these courses, one of the following options may be chosen.

### Option A. Game Management

Wildlife 131, Management of Wildlife Habitat .....	3
Wildlife 132, Management of Wildlife Population .....	4
Wildlife 133, Management Aspects of Wildlife Behavior .....	3
Wildlife 161, Limnology .....	4
or	
Wildlife 166, Aquatic Ecology .....	3
Any two upper division Zoology Courses .....	6-10

### Option B. Fish Management

Wildlife 161, Limnology .....	4
Wildlife 162, Fish Biology .....	4
Wildlife 165, Fish Principles .....	4
Wildlife 166, Aquatic Ecology .....	3
Wildlife 169, Techniques .....	4
Zoology 119, Comparative Anatomy .....	5
Zoology 155, Ichthyology .....	5

### Graduate Study

The advanced degrees, Master of Science and Doctor of Philosophy in Fishery Biology or Wildlife Biology, are granted upon completion of a prescribed course and fulfillment of the Graduate School requirements.

**Assistantships.** The Utah Cooperative Wildlife Research Unit and the Utah Cooperative Fishery Unit provide research assistantships for graduate students in the Department. The Wildlife Resources Department has teaching assistantships. In addition there are grants from the University and outside agencies available to support graduate students. A prospective student should submit formal application with a transcript of college credits and references and, if available, Graduate Record Examination Scores to the Dean of the School of Graduate Studies. Inquiry as to admission should be directed to the head of the Department of Wildlife Resources. Applications for

assistantships should be directed to the head of the department.

## Wildlife Resources Courses

**1. Elements of Wildlife Management.** Introduction to the problems and methods of wildlife management. One lecture. (1Sp) **Wagner**

**99. Wildlife Practice.** Integrated studies of wildlife populations in relation to land uses. Lab fee \$5. (1 Summer Camp) **Kelker**

**131. Management of Wildlife Habitat.** Habitat requirements of game and methods of providing them. Prerequisite: Wildlife 145. Two lectures, one lab. (3F) **Stokes**

**132. Management of Wildlife Populations.** Study of population characteristics of big game, waterfowl, upland game, and furbearers and the implications of these to human exploitation, control of pest species, artificial propagation, and other management problems. Three lectures and one laboratory exercise indoors or in the field weekly. (4W) **Wagner**

**133. Management Aspects of Wildlife Behavior.** Management of major game species with regard to their behavior. Prerequisite: Wildlife 145. Two lectures, one lab. (3Sp) **Balph**

**145. Principles of Wildlife Management.** Characteristics of animals and their habitat in relation to general management practices. Three lectures. (3W) **Stokes**

**148. Animal Behavior.** Maintenance and social activity of a variety of animals stressing behavioral adaptation and behavioral regulation of animal numbers. Three lectures, one lab. (4F) **Stokes**

**150. General Wildlife Management.** Principles of animal ecology and wildlife management; life histories, economics, and management phases of important species of big game, upland game, waterfowl, and fish. Five lectures; field trips arranged. (5F, Sp) **Kelker**

**155. Economic Wildlife.** General importance of wildlife resources; natural history, economic values and control methods for rodents and predators; identification of skulls and skins; brief evaluation of hawks and reptiles. Two lectures, one lab. (3W) **Kelker**

**Ichthyology (Zoology 155).** Ecology, classification, and life histories of native and introduced fishes. Two lectures, two labs. (5W) **Sigler**

**\*\*156. Radiation Ecology.** Distribution and effects of natural and artificially produced radionuclides in the environment. Ecological techniques utilizing radioisotopes. Three lectures. (3Sp) **Martin**

**158. Wildlife Seminar.** Discussions of conservation programs, employment opportunities, and new developments in research and management. (1W) **Low**

**159. Diseases of Fish.** The common diseases of both cold and warm water fish. Methods of diagnosis and treatment. Two lectures. (2W) **Goede**

**160. Animal Ecology.** Distribution and behavior of animals as affected by various environmental factors. Special attention to interrelationships of biotic communities. Four lectures, one lab, including field problems. (5F, Su) **Balph, Wagner**

**161. Limnology.** A study of the physical, chemical and biological interactions in lakes and other bodies of fresh water. Three lectures, one lab. (4F) **Neuhold**

**162. Fishery Biology.** Anatomy, development, respiration, and excretion of fresh water teleosts. Two lectures, two labs. (4W) **Neuhold**

**\*163. Instrumental Ecology.** Theory of instrumental methods used to study environmental factors and their effects on wildlife. Three lectures. (3Sp) **Martin**

**164. Fish Populations.** General population characteristics, methods of enumeration, and determination of mortalities. Prerequisite: Permission of instructor. Two lectures. (2W) **Staff**

**165. Fishery Principles.** Principles of fish management in lakes and streams. Fish population structure and fish life history parameters. Prerequisite: Zoology 155. Three lectures, one lab. (4W) **Kramer, Neuhold, Stalnaker**

**166. Aquatic Ecology.** Relationships between water and various animals, particularly fishes. Special attention to effects of topography, geography, rainfall, water quality, and various aspects of civilization on aquatic resources. Three lectures. (3Sp) **Helm**

**167. Principles of Fish Culture.** The principles of fish culture, fish hatchery management, diseases and nutrition of hatchery-reared fish. Three lectures. (3F) **Workman**

**\*168. World Fishery Resources.** Development, economic significance, problems and application of research to management of selected commercial fisheries of the world. Three lectures. (3Sp) **Kramer**

**169. Fishery Techniques.** Techniques of life history study, fish sampling, habitat management and fish stocking. Prerequisite: Wildlife 165. Three lectures, one lab. (4Sp) **Helm, Neuhold, Sigler, Stalnaker, Workman**

\*Taught 1968-69

\*\*Taught 1969-70



**170. Wildlife Problems.** Individual study and research upon a selected wildlife problem. Three lectures. (1-5F, W, Sp, Su) **Staff**

**172. Problem Orientation.** A discussion of the needs of an approach to wildlife investigations, presenting data, analyzing the problem, and drawing conclusions relative to research in wildlife management. Three lectures. (3W) **Kelker**

**175. Wildlife Law Enforcement.** Review of state and federal regulations of fish and game; discussion of apprehension of violators, collection of evidence and its use in court. Three lectures. (3W) **Sigler**

**210. Advanced Field Problems.** Field training in techniques not covered in undergraduate courses. (1-5F, W, Sp) **Staff**

**248. Analysis of Animal Behavior.** Cause, function and development of behavior among animals. Prerequisite: Wildlife 148. Three lectures, one lab. (4W) **Balph**

**253. Advanced Big Game Management.** Population dynamics, census methods, hunting regulations, and management plans. Prerequisite: Wildlife 153 or equivalent. Two lectures, one lab. (3W) **Wagner**

**257. Graduate Seminar.** Discussion of current investigation and management programs by class and staff members and by representatives of state and federal agencies. (2F, W) **Helm, Neuhold**

**260. Ecology of Animal Population.** Growth, fluctuation, balance, and control of animal populations. Prerequisite: Wildlife 150 or equivalent. Four lectures. (4W) **Wagner**

**261. Advanced Limnology.** Advanced study of factors affecting productivity of fresh water. Prerequisite: Wildlife 161 or equivalent. Two lectures, two labs. (4F) **Sigler**

**\*\*262. Fish Population Theory.** Study and discussion of the mathematical models which are in use in the field of fisheries. Four lectures, one discussion period. (5W) **Kramer**

**270. Research and Thesis.** Credit for field or laboratory research, library work and thesis writing. (1-5F, W, Sp, Su) **Staff**

**280. Seminar in Animal Population.** Advanced readings, discussion, and critical analyses of population dynamics, limiting mechanisms, and theories of population regulation in animals. One class weekly. (1F, W) **Wagner**

**281. Aquatic Environmental Interactions.** Advanced readings analyses, and discussion on the effects of interacting physical, chemical, and biological factors of the aquatic environment on aquatic animals. One class weekly. (1F, W, Sp) **Neuhold**

**282. Seminar in Animal Behavior.** Advanced readings, discussion, and critical analyses of current research in animal behavior and behavioral ecology. One class weekly. (1F, W) **Balph**

**\*\*Taught 1969-70**







*COLLEGE OF SCIENCE*

*College of*

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## Degrees Offered:

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Bachelor of Science

Master of Science

Doctor of Philosophy

## College of

# Science

Ralph M. Johnson, **Dean**  
Office in Forestry and Zoology 101

Utah State University has always given a high place to the sciences. Our twentieth century civilization is based on science, and every facet of this great area is fundamental in a land-grant university such as this one.

The eight departments in the College of Science offer the following majors: Applied Statistics, Computer Science, Bacteriology, Public Health, Medical Technology, Cytogenetics, Plant Ecology, Plant Nutrition, Biochemistry, Plant Pathology, Plant Physiology, Taxonomy, Virology, Chemistry—Inorganic, Physical, Analytical, Organic and Biochemical; Petroleum Geology, Mineralogy, Economic Geology and Ground Water Geology, Mathematics, Mathematics Teaching, Nuclear Physics, High Energy Physics, Space Science, Theoretical Physics, Zoology, Entomology, Physiology, Pre-Dentistry, Pre-Medicine and Nursing.

Opportunities for rewarding careers are excellent in all these fields. Opportunities exist in education, research, conservation, service, sales, hospitals, industry and engineering concerns, just to name a few.

The curricula of the science departments are designed to achieve four purposes:

First, they serve all students, because no college graduate today can be considered educated without a firm grasp of scientific principles. The sciences are truly liberal. They contribute to the general education as surely and as

importantly as the humanities and the arts and the social sciences.

The second purpose of the College is to train teachers of science. This is an increasingly significant responsibility. America cannot move forward unless it has competent, well trained teachers of science on every level of education.

Third, the health professions are properly grounded on science. The University has an excellent record in providing pre-dental and pre-medical training. Students in these programs move directly into the professional dental and medical schools of other universities. The basic training of these people will continue to be an important part of the program in the College of Science.

Finally, the College of Science trains research scholars in the various areas of science. To become a competent chemist, physicist, geologist, or scientist in any other area, the student must have a sound undergraduate major in the subject, followed by years of graduate specialization in his field. All of the departments mentioned above offer the Bachelor's and Master's degrees and the majority of them offer the PhD degree. The production of able research scientists is of prime importance and is a major function of the departments in the college.

The opportunities for competent and conscientious students in the various science fields is unlimited. Demands for teachers and researchers are far greater than the

supply. Monetary rewards are substantial and the spiritual and intellectual rewards satisfying. Science is challenging. It demands the best from students, but for those who succeed it offers a rich return.

Students planning to enter the sciences are urged to discuss their plans and goals early with their advisers, department heads, and dean.

Basic course work in mathematics, chemistry, and physics is essential to most areas of science. Several scholarships are available to science students. Teaching and research assistantships are available through the science departments. General requirements for graduation are the same as those outlined for the entire University.

### Department of

## Applied Statistics, Computer Science

**Head:** Professor Rex L. Hurst  
Office in Main 2

**Associate Professors** Bartell Jensen, Donald V. Sisson; **Assistant Professors** David R. Harris, Eugene C. Kartchner, Wendell L. Pope, David White.

**Degrees:** Bachelor of Science (BS), Master of Science (MS).

**Majors:** Applied Statistics, Computer Science.

The Department of Applied Statistics and Computer Science has as its primary interest the methods of applying mathematics to the solution of practical problems.

Students who have ability in mathematics and are curious about the world around them may well find a challenging and exciting future through the Applied Statistics and Computer Science Department.

All staff members in the department are involved in consulting work with research workers both on and off campus. This department is also connected with the University Computer Center. The research consulting activities of the statistics group and the data processing activities of the computer science group provide a large number of job opportunities for majors in these subjects. This al-

lows them to apply the things they are learning in the classroom directly to practical problems.

### Applied Statistics

Statistics is that 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.

Experimental scientists in many fields of endeavor make extensive use of statistics as a research tool. Statistics provides the methodology for summarizing data, estimating parameters, testing of hypoth-

eses, and formulating mathematical models to simulate physical and biological situations.

Applied Statistics majors are prepared for further graduate study or for accepting a wide choice of well-paid positions. Statisticians find employment as members of research teams in business, industrial concerns, the federal government, state governments, and private research groups. All of these provide outstanding possibilities for professional advancement.

## Undergraduate Study

**Bachelor of Science Degree.** For a major in Applied Statistics students are expected to complete Applied Statistics 131, 132, 133, 134, 141, 176, 177, 178, and 199. Some credit should be taken in Special Problems 198. They are also expected to take extensive work in Mathematics or Economics and Computer Science.

**Undergraduate Minor.** An undergraduate minor in Applied Statistics is expected to complete at least 18 credits from the following courses: Applied Statistics 131, 132, 133, 134, 141, 176, 177, 178; Computer Science 145, 146, 167, 175.

## Lower Division

### FRESHMAN and SOPHOMORE YEARS

	Credits
English 1, 2, 3 .....	9
Physical Education .....	3
Math 46, 96, 97, 98, 99 .....	25
Philosophy 50 .....	5
Economics 51, 52 .....	10
Applied Statistics 51 .....	4
Physics (20, 21, 22) (17, 18, 19) or Chemistry (10, 11, 12) (20, 21, 22) .....	15
Electives (including remainder of group requirements) .....	29
Total .....	100

## Upper Division

### JUNIOR and SENIOR YEARS

	Credits
Applied Statistics 131, 132, 133, 134, 141, 150, 176, 177, 178, 198, 199 .....	35
Computer Science 167, 175 .....	8
Math 126 .....	3
Electives .....	54
Total .....	100

### JUNIOR and SENIOR YEARS

#### (Econometrics Major)

Applied Statistics 131, 132, 133, 134, 141, 176, 177, 178, 199 .....	29
Computer Science 167, 175 .....	8
Math 126, 160 .....	6
Economics 107, 108, 140, 165, 180, 290, 291, 292 .....	30
Electives (a selection from Math 110, 127, 128, 130, 131, 132, 145, and Com- puter Science 145, 146 is recommended) .....	27
Total .....	100

## Computer Science

Computer Science deals with the organization and usage of data processing systems. Data processing systems consist of digital or analog computers and the associated data transmission networks.

One phase of Computer Science deals with the development of data processing systems as part of business or research organization. It treats such problems as data collection, forms design, modernization of accounting and paper work procedures, modernizations of reports, selection of computer and data transmission components to build complete systems.

A second phase of Computer Science deals with the methods and theory of programming computers and data transmission equipment to handle all types of numerical and logical information. Programming a computer or data transmission system consists of providing step-by-step instructions that will produce the desired result.

The Computer Science area is one of the fastest growing parts of



our society. Areas such as industrial automation, involving numerical and process control, business automation, and a wide variety of scientific computations offer a wide range of employment opportunities.

**Bachelor of Science Degree.** The department offers a degree program with emphasis in either Mathematics or Management Science. For either phase the student must have: at least 26 credits of Computer Science; at least six credits of Applied Statistics, mathematics through calculus, at least 15 credits of either Physics or Chemistry, at least 10 credits of Economics, at least five credits of Logic, and all University requirements for graduation.

### Lower Division

#### FRESHMAN and SOPHOMORE YEARS

	Credits
English 1, 2, 3 .....	9
Physical Education .....	3
Math 46, 96, 97, 98, 99 .....	25
Philosophy 50 (Logic) .....	5
Economics 51, 52 .....	10
Computer Science 11 .....	3
Physics 17, 18, 19, or 20, 21, 22, or Chemistry 10, 11, 12 or 20, 21, 22 .....	15
Electives (including lower division requirements) .....	29
<b>Total</b> .....	<b>99</b>

### Upper Division

#### JUNIOR and SENIOR YEARS

(Mathematics Option)

Computer Science 145, 146, 158, 167, 168, 175, 181, 182, 196, 197 .....	30
Applied Statistics 131, 132 .....	8
Math 126, 127, 128 .....	9
Philosophy 161 (Symbolic Logic) .....	5
Electives (a selection from Math 116, 117, 118, 123, 124, and 160, or Applied Statistics 133, 134, 141, 176, 177, 178 is recommended) .....	48
<b>Total</b> .....	<b>100</b>

#### JUNIOR and SENIOR YEARS

(Management Science Option)

Computer Science 145, 146, 157, 158, 168, 175, 181, 182, 196, 197 .....	30
Applied Statistics 131, 132, 141 (Busi- ness Statistics 131, 132 may be substi-	

tuted on approval for Applied Statis- tics 131, 132) .....	11
Business Administration 118, 133, 34, 151, 171, 181 .....	26
Accounting 209, 210 .....	6
Math 126 .....	3
Electives (a selection from Business Administration 138, and Computer Science 245, 246 is recommended to be included) .....	27
<b>Total</b> .....	<b>103</b>

### Graduate Study

**Master of Science Degree.** The department offers the Master of Science degree in Statistics. The area of research includes: 1) development of new tools of statistical inference, 2) refinement of old techniques, 3) improvement and development of the design of experiments. Students will be encouraged to take a strong minor in Computer Science.

A student seeking an MS degree in Statistics should have either a BS degree in Statistics or a BS degree in Mathematics. Majors in fields of application with a strong background in Mathematics may also be considered.

Financial assistance is available in the form of graduate assistantships for outstanding candidates. USU also offers a limited number of research fellowships which are open to all majors.

### Applied Statistics Courses

#### Undergraduate Courses

**51. Elementary Statistics.** An introduction to the nature of statistical reasoning. The nature of observations. The condensation and presentation of data. Elements of sampling. The use of statistics in making estimates and drawing conclusions. Prerequisite: Math 35 or equivalent. (4F) **Staff**

**121. Statistical Methods for the Social Sciences.** A computer oriented course in elementary statistics, designed for students whose majors are in Sociology, Education, and the family living areas. Data and examples are from the social sciences. Random sampling. Population parameters and their sample estimates. Frequency distributions. Use of data

processing equipment. Analysis of variance. Contingency tables. Data processing for analysis of variance and contingency tables. Practice in the design, execution, and interpretation of results for statistically oriented research projects. Prerequisite: high school Algebra. (4F) **White**

**122. Statistical Methods for the Social Sciences.** A continuation of Applied Statistics 121. Elementary Probability. Two-way contingency tables. Double and triple summation. Analysis of variance tables. Fixed and random models in Analysis of Variance. Cluster sampling and its relationship to analysis of variance. Data processing for analysis of variance with cluster sampling. Prerequisite: Applied Statistics 121. (4W) **White**

**123. Statistical Methods for the Social Sciences.** A continuation of Applied Statistics 122. Three stage cluster sampling; components of variance. Stratified sampling; randomized block designs; interaction in randomized block designs; data processing. Graphing equations; regression analysis. Analysis of covariance. Data processing for regression analysis and analysis of covariance. Bivariate frequency distributions; correlation coefficients. (4Sp) **White**

**131. Statistical Methods.** Sample-based inferences about populations. Individual and group comparisons. Tests of significance. Linear regression and correlation. Prerequisite: Math 35 or equivalent. (4F, W) **Staff**

**132. Statistical Methods.** Analysis of variance and covariance. Individual degrees of freedom. Multiple regression. Prerequisite: Ap St 131 or equivalent. (4W, Sp) **Staff**

**133. Statistical Methods.** Multiple regression, curvilinear regression, multiple and curvilinear covariance, least squares analysis of basic designs. Prerequisite: Ap St 132. (4Sp) **Hurst**

**134. Design of Experiments.** Fundamental principles of experimental design; completely randomized; randomized blocks, latin squares, components of variance; factorial arrangements; confounding; split plot; incomplete block designs; and fractional replication. Prerequisite: Ap St 132 or equivalent. (4Sp) **Sisson**

**141. Sampling Methods.** The methods and theory of obtaining sample estimates of population characteristics. Reliability of sample estimates. Types of sampling procedures. Analysis and interpretation of samples. Prerequisites: Ap St 51, 131, or equivalent. Three lectures. (3W) **Staff**

**150. Computer Applications in Statistics.** Editing and reworking data prior to analysis, using Monte-Carlo methods to design experiments; the analysis of experimental design

data; the analysis of questionnaire data; covariance analysis of basic designs; pooled analyses. Prerequisites: Ap St 133, 134; CS 167. (3W) **Hurst**

**171. Statistical Theory for Research Workers.** An introduction to the theory of statistical inference; probability; discrete and continuous probability density functions and their properties; expected values; variances, moments, cumulants and their generating functions; orthogonal linear functions; sampling distributions; central limit theorem. Prerequisite: Calculus. (3) (Taught on demand) **Staff**

**172. Statistical Theory for Research Workers.** Optimum properties of estimators; theory of point estimation; principle of maximum likelihood; theory of confidence interval estimation and test of hypothesis; likelihood ratio test; goodness-of-fit test; theory of least squares general linear hypotheses and their application to regression and experimental design. Prerequisite: Ap St 171 (3) (Taught on demand) **Staff**

**176. Introductory Theory of Statistics.** Set operations combinatorial methods, probability, discrete frequency distributions, expectations, moments and moment generating functions. Prerequisite: Calculus and a knowledge of statistical methods. (3F) **Staff**

**177. Introductory Theory of Statistics.** Continuous frequency distributions, expectations, moments and moment-generating functions, linear combinations of variables, sampling and sampling distributions, point and interval estimation. Prerequisite: Ap St 176. (3W) **Staff**

**178. Introductory Theory of Statistics.** The testing of hypotheses, Type I and Type II errors, power of the test, application of theory to the testing of means and to testing of relationships among variables. Prerequisite: Ap St 177. (3Sp) **Staff**

**198. Special Problems.** Conferences, reading, and laboratory investigations. Credit arranged. (F, W, Sp) **Staff**

**199. Seminar** Review of current literature and developments in the field of statistics. (1-3F, W, Sp) **Staff**

## Graduate Courses

**221. Industrial Statistics—Sampling Inspection.** Control of quality of manufactured products; attribute and variable inspection; single, double, and sequential plans; sampling plans for continuous production; cost functions and elementary decision functions. Prerequisites: Ap St 177, 262. (3Su) (Taught on demand) **Staff**

**233. Biological Statistics.** Biological assays; quantitative and quantal responses; dosage response relationships; parallel line and slope-

ration assays; relative potency and LD 50; biological populations and transformations. Prerequisite: Ap St 132. (3Sp) (Taught on demand) **Sisson**

**241. Stochastic Processes.** An introduction to stochastic processes and their properties. The probability law of a stochastic process. Conditional probability and conditional expectation. Fundamental properties of specific stochastic processes; the Normal process, the Wiener process, the Poisson process and its generalizations. Counting and renewal counting processes. Markov chains. Specific applications to physics, communication theory, biology, economics, etc. Prerequisite: Probability Theory. (Taught on demand) **Staff**

**250. Computer Applications in Statistics.** Using Monte-Carlo methods to generate data according to mathematical models, experimental design data, regression data; the analysis of regression data, multiple regression, generalized curve fitting; the generalized analysis of covariance; multivariate analysis of variance and covariance; factor analysis; Canonical Correlation; Discriminant Functions. Prerequisites: Ap St 150, 291. (3Sp) **Staff**

**261. Intermediate Theory of Statistics.** Probability theory; basic notion of sets, sample description space, events, algebra of events, probability of an event, probability theorems, combinational analysis, conditional probability, Bayes' Theorem, independent events, independence of several events, random variable, probability functions, distribution functions, discrete distributions; Bernoulli trials, Binomial, Multinomial, Hypergeometric, Poisson, negative binomial distributions, limiting theorems, continuous distributions, probability functions for continuous variate, multivariate distributions, transformations, expectation of a random variable, expectation, moment, moment generating functions, moments of multivariate distributions. Prerequisites or corequisites: Math 99, 160. (5W) **White**

**262. Intermediate Theory of Statistics.** Important continuous distribution, uniform, normal, gamma, beta distribution and others, inductive inference; populations and samples, Chebyshev's inequality; law of large numbers; the central limit theorem; point estimation; optimum properties of estimators; principle of maximum likelihood; multivariate normal distribution; bivariate normal, multivariate normal marginal and conditional distributions; the moment generating functions; derived distributions; distributions of functions of random variables, chi-square, student's F distributions; large sample theory; asymptotic distributions of maximum likelihood estimators. Prerequisite: Ap St 261. (5W) **White**

**263. Intermediate Theory of Statistics.** Interval estimation, confidence limits, fiducial limits, confidence interval and regions for

parameters of well-known distributions, test of hypotheses; regression and linear hypotheses; analysis of variance; sequential tests of hypotheses and distribution-free methods. Prerequisite: Ap St 262. (5Sp) **White**

**281. Sampling Design.** Principle steps in sample surveys; simple random sampling; properties of the estimators; sampling for proportions and percentages; estimation of sample size; two stage sampling; stratified random sampling for percentages. Prerequisite: Ap St 172 or 263. (3F) (Taught on demand) **Sisson**

**291. Applied Experimental Design I.** A course dealing with analysis of variance techniques commonly encountered in many fields of research. Variance components; nested and crossed relationships between factors; generalized methods of obtaining expected mean-squares in analysis of variance; analysis of covariance; data with unequal numbers of observations in subclassifications; utilization of appropriate computer programs. Prerequisites: Ap St 134 and 173 or 178. (3F) **White**

**292. Applied Experimental Design II.** General least-squares theory for experimental designs; confounding for symmetrical factorial designs, number of levels a prime power; fractional replications; double confounding; latin squares; partial confounding; balanced incomplete block designs. Prerequisites: Ap St 291, Math 160. (3W) **White**

**293. Applied Experimental Design III.** General formulas for  $p^n$  factorials; confounding plans for prime-power factorials; confounding plans and fractional replications for mixed factorials; sequential analysis. Prerequisite: Ap St 292. (3Sp) **White**

**297. Thesis and Research.** Outlining and conducting research in statistics. Thesis preparation. Credit Arranged. (F, W, Sp, Su) **Staff**

**298. Special Problems.** Individual study and report preparation in areas of special interests. Training in professional consulting. (F, W, Sp) **Staff**

## Computer Science Courses

### Undergraduate Courses

**11. Introduction to Computer Science.** Methods of collecting and processing information. Manual and automated data collection systems. The use of digital computers in data processing and scientific computing. The structure and usage of computer based languages. History and philosophy of computing. (3F, W, Sp) **Staff**

**145. Computer Programming.** The characteristics and instruction repertoire of a modern digital computer; the organization of problems

for solution using a computer; the use of machine language programming in problem solving. Prerequisite: CS 11 or permission of instructor. (3W) **Staff**

**146. Computer Programming.** Continuation of CS 145. Assembly level languages for programming digital computers. Students are expected to gain programming proficiency sufficient to be able to solve problems from their own fields using a computer. Prerequisite: CS 145. (3Sp) **Staff**

**157. Programming Business Problems (FORTRAN).** Discussion of problem oriented programming language; contrasting the more common languages with regard to their most effective areas of application. This course will define the characteristics and applications of the FORTRAN programming language as it relates to business problems. Students are expected to learn the fundamentals of the FORTRAN language and to gain experience in applying the computer to the solution of typical problems arising in the business world using this language. Prerequisite: CS 11 or permission of instructor. (3F, W) **Kartchner**

**158. Programming Business Problems (COBOL).** Discussion of problem oriented programming languages. This course will define the characteristics and application of the COBOL (Common Oriented Business Language) programming language. Students are expected to learn the fundamentals of COBOL, and to gain experience in writing COBOL programs for the purpose of solving problems in their own areas of interest through the use of a computer. COBOL is designed primarily for problems dealing with updating, analyzing, and reporting data contained in file form while FORTRAN is particularly applicable to Operations Research Type problems. Prerequisite: CS 11 or permission of instructor. (3W, Sp) **Kartchner**

**167. Programming Scientific Problems.** Discussion of problem-oriented programming languages (compilers); the use of a compiler language to write programs for a computer. Students are expected to learn a programming language (such as FORTRAN) and to solve problems in their own fields using a computer. Prerequisite: CS 11 or permission of instructor. (3F, W, Sp) **Staff**

**168. Advanced Programming.** Discussion of the problems involved in implementing higher

level languages; the algorithmic language ALGOL for describing algorithms; special programming problems. Prerequisites: CS 146 and CS 167. (3F) **Staff**

**175. Operations Research: Methods and Problems.** A study of the problems and methods in operations research. Problem areas to be included for analysis are: inventory, replacement, waiting lines, competitive strategies, allocation, sequencing and dynamic programming. Prerequisites: Econ 52 and Math 99. (5F) **Jensen**

**181. Compiler Languages.** The construction of symbolic language processors, problem-oriented language processors, procedure oriented language processors, and their supporting libraries. Prerequisite: CS 168. (3W) **Staff**

**182. Monitors and Systems Design.** The organization and construction of a monitor; the organization of supporting systems, including utility programs, input/output programs, report generators, simulator systems, and sort systems. Prerequisite: CS 181. (3Sp) **Staff**

**196. Special Problems.** This course is designed to give the student an opportunity to apply the knowledge that he has gained in the preceding courses in Computer Science to the solution of problems that are of particular interest either for the staff member or for the student involved. Credit arranged. **Staff**

**197. Seminar.** Review of current literature and developments in the field of Computer Science. (1Sp) **Staff**

## Graduate Courses

**245. Operation Research.** A study of the methods and techniques used in operations research and systems engineering to efficiently organize complex systems. The study will include linear programming, assignment and allocation of resources, inventory control, least cost estimating and scheduling. Prerequisite: Graduate standing or permission of the instructor. (3W) **Jensen**

**246. Operation Research.** Continuation of Computer Science 245. Study will include queuing theory, replacement models, dynamic programming, game theory and Monte Carlo methods. Prerequisite: Graduate standing or permission of the instructor. (3Sp) **Jensen**

*Department of*

## Bacteriology and Public Health

**Head:** Professor Rex S. Spendlove  
Office in Plant Industry 309

**Professors** Lewis W. Jones, Gary H. Richardson; **Professors Emeritus** W. Whitney Smith, Kenneth R. Stevens; **Associate Professors** Paul B. Carter, Frederick J. Post; **Assistant Professor** Carl A. Westby; **Lecturers** Newell G. Daines, Russell S. Fraser, Ray N. Malouf.

**Degrees:** Bachelor of Science (BS), Master of Science (MS), Doctor of Philosophy (PhD).

**Majors:** Bacteriology, Public Health, Medical Technology.

**Bacteriology.** The microbes have always dominated much of man's effort and even today lead us on an interesting and challenging chase. Today research is being conducted in many areas including preventative and curative medicine, food production and preservation, and water and marine microbiology.

USU offers the Bachelor of Science, Master of Science and Doctor of Philosophy degrees in Bacteriology. A bacteriologist may gain employment in either private or governmental agencies, industry, business, organizations, laboratories, or institutions. Other possibilities are employment to do research in medicine, food and dairy products manufacturing, public health, and positions as teachers.

**Medical Technology.** While there have been medical laboratory workers for many years, the profession of Medical Technology is relatively recent. USU offers the BS degree in this field.

The Registry of Medical Technologists, working with the American Medical Association, establishes the basic educational requirements. Presently, the requirements are three years of college preparation with a one-year internship which is accepted as a

year of college work. When a student completes this fourth year, he obtains a BS degree and becomes eligible to take the nationwide examination given by the Registry of Medical Technologists.

There is a need for people to prepare for general laboratory work as well as for specialization. Positions are available in hospitals, clinics, industry, public health, teaching, and research.

**Public Health.** The degree of man's happiness and the rate and quality of his progress have always been a reflection of the level of his health. All of the wealth, power, and knowledge in the world are of little value to a person if he is too ill to use them.

Scientific research by bacteriologists, virologists, sociologists, psychologists, geneticists, chemists, nutritionists, and others has equipped our various health practitioners with an ever increasing number of tools with which to improve the health of man. A means must now be found to incorporate all valuable health information quickly into our present health program, and this requires specialists.

USU offers a BS degree in Public Health. Graduates may seek employment in business, industry,



schools, and other educational and service organizations, and voluntary or governmental health agencies. Employment as public health educators, sanitarians, nurses, nutritionists, administrators, laboratory specialists, mental workers, and social workers are possibilities.

## **Bacteriology**

### **Undergraduate Study**

#### **Bachelor of Science Degree.**

Preparation for the major should include the following courses: Biology 15; Botany 26; Zoology 16; Chemistry 20, 21, 22, 115, 121, 122; Physics 17, 18, 19; Math 35, 46; and Bacteriology 70. These may be used to fulfill group requirements.

**Major.** The major requires 43-47 credits as follows: Zoology 112; Chemistry 180 (or 190); Bacteriology 160, 168, 180, one credit of 198, and three of the following Bacteriology courses: 104-5, 110, 120-1, 170, 192; and at least 8 credits (with consent of the adviser) from Botany 150, 160, Chemistry 101, Zoology 116, 235, Applied Statistics 131, and English 111. Students who anticipate graduate work should include a year's sequence of a modern language.

Students meeting requirements for the Bachelor of Science degree in Bacteriology by taking Zoology 118 are eligible to apply for admission to dental or medical schools.

### **Graduate Study**

The Department of Bacteriology and Public Health has good facilities for research and advanced studies. It occupies the third and part of the fourth floor of the Plant Industry Building. The usual technical instruments are available. The department also has access to an electron microscope, ultracentri-

fuge, electrophoresis apparatus, spectograph, flame spectrophotometer, and other major research instruments.

**Master of Science in Bacteriology.** (See also Master of Science degree in School of Graduate Studies in this catalog.) The master's degree in Bacteriology combines a substantial research effort with a rounding out of course work in Bacteriology and related subjects. At the conclusion of the Master's degree, candidates are expected to have completed the Bacteriology courses offered in the department, plus Chemistry through some advanced Biochemistry courses, Mycology and Protozoology.

**Doctor of Philosophy in Bacteriology.** (See also Doctor of Philosophy degree in School of Graduate Studies section.) The doctorate in Bacteriology is primarily a research degree. A doctoral thesis comprising an intensive and definitive contribution to knowledge is the most basic requirement.

In previous training or in the Doctoral program, candidates are expected to complete course work in Bacterial Physiology, Immunology, Systematic Bacteriology, Soil, Dairy Food, Pathogenic, and Aquatic Microbiology, as well as Mycology, Protozoology and Virology.

Appropriate supporting courses are expected in Biochemistry, Physical Chemistry, Genetics, Pathology, Entomology, Plant Physiology, Cellular Physiology and other science specialties.

Candidates are expected to offer certain research tools: Applied Statistics, and a reading knowledge of German, Russian, or French; or a reading knowledge of two foreign languages of scientific significance; or suitable substitutes justified by the nature of the Doctoral program.

**Biology Courses**

**1. Principles of Biology.** A study of the basic principles of life as illustrated by both plant and animal forms, including microbes. Four lectures, one recitation, one lab. (5F, W, Sp) **Staff**

**15. General Biology.** A study of the structures and functions common to living things. Cellular and molecular processes are emphasized. A knowledge of high school chemistry is assumed. This course or consent of the instructor is prerequisite to all bacteriology courses except Bacteriology 10. Five lectures, one lab. (5F, W, Sp) **Staff**

**Bacteriology Courses**

**10. Elementary Bacteriology.** Basic concepts and practical applications. This course is intended to be a terminal course for non-science majors. Students in science or science-related areas should not enroll in this course (not open to students who have completed Bact. 70). Four lectures, one lab. (5F, W, Sp, Su) **Staff**

**70. General Bacteriology.** The fundamental principles of bacteriology and their application to food, water, dairy, soil and disease. This course is designed for students in all areas of science and related fields. Prerequisite: Biology 15 or equivalent. Recommended: College Chemistry 20, 21, 22, or 10, 11, 12. Three lectures, two labs. (5F, W, Sp) **Staff**

**Upper Division Courses**

Bacteriology 70 or equivalent with a grade of C or better is required for all upper division Bacteriology courses.

**104. Dairy Bacteriology.** Microorganisms of milk and its products. Prerequisite: Bact. 70. (3F) **Jones**

**105. Dairy Bacteriology Laboratory.** Two three-hour labs. Prerequisite: previous or concurrent registration in Bact. 104. (2F) **Jones**

**\*110. Soil Microbiology.** Relationships of microorganisms to soil fertility. (2Sp) **Jones**

**120. Food Microbiology.** Relationships of microorganisms to food preservation, spoilage, and poisoning. (2W) **Post**

**121. Food Microbiology Laboratory.** Prerequisite: Previous or concurrent enrollment in Bact. 120. (2W) **Post**

**160. Pathogenic Bacteriology.** Properties of pathogens and relationships to infectious diseases. Prerequisite: Organic Chemistry. Three lectures, two labs. (5F) **Carter**

**\*\*161. Advanced Pathogenic Microbiology.** Common pathogenic molds, yeasts, and viruses. Prerequisite: Bact. 160. Four lectures, one lab. (5Sp) **Staff**

**168. Immunology.** Prerequisites: Bact. 160 and Biochemistry. Three lectures, two labs. (5W) **Carter**

**170. Virology.** An introduction to viruses including considerations of chemical, physical, and hereditary characteristics; pathogenesis; immunity; virus-host relationships. Prerequisite: Immunology or consent of instructor. Three lectures, two labs. (5W) **Spendlove**

**\*\*172, 173. Bacteriology Laboratory Methods.** (2W, 2Sp) **Staff**

**180. Physiology of Bacteria.** Cellular chemistry and physiology. Prerequisite: Organic Chemistry. (4W) **Westby**

**192. Aquatic Microbiology.** Principles of microbiology (limited to the Kingdom Protista) relevant to the aquatic environment. Emphasis is placed on fresh water and waste water with some discussion of estuarine and marine microbiology. Prerequisites: Bact. 70, or Civil Engineering 194 and Wildlife Resources 161. Three lectures, one lab. (4Sp) **Post**

**198. Undergraduate Problems Course.** Special directed studies on current problems and research in microbiology utilizing the literature, seminar, and laboratory investigation as it suits the student. May be repeated for credit. (1-3F, W, Sp, Su) **Staff**

**\*201. Systematic Bacteriology.** Classification relationships. (2F) **Smith**

**291. Seminar.** (1F, W, Sp) **Staff**

**294. Special Problems in Bacteriology.** Special assignments, reports, and discussions. Preparation of a comprehensive and critical review. Credit arranged. Prerequisite: Consent of instructor. (F, W, Sp) **Staff**

**299. Thesis Research.** Credit arranged. (F, W, Sp, Su) **Staff**

**Public Health**

**Bachelor of Science in Public Health.** Preparation for the major should include the following courses: Biology 15; Zoology 16; Physics 6; Economics 51; Psychology 53; Sociology 70; Chemistry 10, 11, 12; Mathematics 35, 44; and Bacteriology 70.

\*Taught 1968-69

\*\*Taught 1969-70

A student may major in one of two options, Health Education or Environmental Health (Sanitation). Students in the latter option, with appropriate choice of courses may also meet civil service requirements for microbiologist.

**Health Education option.** See W. Whitney Smith, Bacteriology, or Janice Pearce, Physical Education, for required courses.

**Environmental Health (Sanitation) option** requires Geology 3; Public Health 150, 254; Bacteriology 160, 120-121, 104-105, 192; Psychology 161; Landscape Architecture 170; Political Science 151; Entomology 115; Applied Statistics 51 or 131; and 21 credits selected with the approval of the adviser from the areas of Food Sciences, Water, Recreation and Conservation, or Social Sciences and Administration. A listing of these courses may be obtained from the adviser. An additional 37 credits is available for electives.

For a minor in Health Education, a student should take Public Health 15, 50, 150; Physical Education 135; Principles of Nutrition 22 or 140; and Psychology 145.

## Public Health Courses

**15. Personal Health.** Health problems of University students; especially for Freshmen and Sophomores. (2W) **Malouf**

**50. Fundamentals of Public Health.** A basic course in the principles of public health with major emphasis on health education, control of communicable diseases, community sanitation problems, radiological health. (3Sp) **Smith**

**149. Current Problems in Community Health.** The current emerging problems: air and water pollution, effects of urbanization and the population explosion, proliferation of agricultural poisons, low incidence of communicable disease, radiation hazards, etc. (2W, Su) **Smith**

**150. Environmental Sanitation.** Consideration of regular public health sanitation programs such as waste disposal, water treatment, refuse disposal, insect and rodent control, food and milk, industrial hygiene and radiological sanitation. (4Sp) **Post**

**\*\*151. Public and School Health Administration.** Organization, administration and functions of health agencies. Prerequisite: PH 50. (3W) **Smith**

**152. Family Health.** A broad course on the fundamentals of healthful living. Open to all upper division students; especially for Juniors who are required to take a course in family health for state of Utah certification. Does not meet the school health requirement for state of Utah certification. (3F) **Daines**

**153. World Health Problems.** Designed to meet the health needs of persons who plan to work or travel in foreign lands. Personal and environmental health problems in specific regions of the world. (1Su) **Staff**

**154. School Health Program.** The program for health in elementary and secondary schools. A healthful environment, healthful living, and health instructions. (4F, W, Sp, Home Study) **Smith**

**155. Health Education for Teachers.** School health. Classroom health problems. Communicable diseases of the classroom. School health laws. (3F, W, Sp, Su) **Smith**

**\*\*156. School Health Methods.** Objectives, methods, curricula, and materials. Prerequisite: PH 155. (3Sp) **Staff**

**159. Public Health Laboratory Methods.** Experience in the practice of the Public Health Laboratory. (3-15F, W, Sp) **Fraser**

**254. Special Problems in Public Health.** Assignments, reports, discussions. Preparation of a comprehensive and critical review. Credit arranged. (F, W, Sp) **Staff**

## Medical Technology

The College of Science offers courses which satisfy entrance requirements for Medical Technology internships in the United States and Canada. The University provides a three-year program which, combined with the internship, qualifies the student for the BS degree.

A Medical Technology major should take during the first three years: Bacteriology 70, 160, 168; Medical Technology 131; Biology 15; Chemistry 20, 21, 22, 121, 115, 180; Physiology 4; Physics 6; Zoology 16, 116. A hospital internship for twelve months is completed dur-

**\*\*Taught 1969-70**

ing the fourth year. This includes instruction in Medical Technology 133, 134, 135, 136, 137. This internship is available in the LDS hospitals of Salt Lake City, Ogden and Idaho Falls, and at St. Benedict's hospital in Ogden. During this fourth year, students register for three quarters (45 upper division credits in Medical Technology). When this program is satisfactorily completed, a student is eligible for the Bachelor of Science degree in Medical Technology. A student may then also apply for certification by the Registry of Medical Technologists, after completion of a qualifying examination given by the American Society of Clinical Pathologists. Consult Professor Paul B. Carter for further details.

### Department of

## Botany

**Head:** Professor Orson S. Cannon  
Office in Plant Industry 204

**Professors** W. S. Boyle, George W. Cochran, Arthur H. Holmgren, Gene W. Miller, Richard J. Shaw, Herman H. Wiebe; **Associate Professor** George W. Welkie; **Assistant Professors** Gerald M. Baker, Ivan G. Palmblad; **Research Associates** John L. Chidister, Gertrude Hsieh; **Collaborators** Eugene H. Cronin, Richard Farrar, Gerald D. Griffin, Lynn L. Hoefert, Edsel C. Jorgenson, Lester B. Kreps, Walter T. McDonough, David Mumford, Bryce N. Wadley, M. Coburn Williams, David E. Zimmer.

**Degrees:** Bachelor of Science (BS), Master of Science (MS), Doctor of Philosophy (PhD).

**Majors:** Cytogenetics, Plant Pathology, Plant Physiology, Plant Ecology, Taxonomy, Virology.

The Department of Botany provides a foundation for all plant science fields. Its graduates may obtain positions in applied fields, such as agricultural extension agents, field men, farm managers, laboratory technicians, park naturalists and rangers. Additional op-

### Medical Technology Courses

**131. Clinical Laboratory Methods.** Prerequisite: Bacteriology 70. (4Sp) **Carter**

**133, 134, 135. Applied Medical Technology.** Practical work in hospital laboratories under close supervision: Clinical Bacteriology and Serology, two months; Clinical Biochemistry, three months; Clinical Hematology, one month; Pathological Tissue Methods, two months; Blood Bank Procedures, two months; Electrocardiograph and Basal Metabolism Procedures. (13F, W, Sp) **Carter**

**136. General Pathology Discussions.** (2F) **Carter**

**137. Clinical Laboratory Methods Discussion.** (2W) **Carter**

**138. Blood Bank and Blood Serology Techniques.** (1Sp) **Carter**

**139. Pathological Conference.** (1Sp) **Carter**

portunities become available to those with the MS or PhD degrees. Students whose undergraduate grades average B or better usually can secure fellowships or assistantships that will finance their graduate work.

Majors in Botany obtain train-

ing in Applied Statistics, Bacteriology, Chemistry, Mathematics, Physics, and Zoology as well as in Botany. Specialization usually follows the BS degree.

**Plant Taxonomy.** The Intermountain Herbarium contains over 110,000 plant specimens and also has the most complete taxonomic library in the Intermountain region. The Herbarium is in constant use by students and faculty of many departments.

**Plant Physiology and Plant Nutrition and Biochemistry.** Outstanding research and teaching are conducted in Plant Physiology, Plant Nutrition, and Biochemistry.

**Plant Cytogenetics.** The effects of gamma radiation and colchicine on grass hybrids are being studied in Cytogenetics. Studies in this field reveal many basic facts regarding heredity and evolution.

**Plant Pathology and Virology.** Diseases often cause heavy plant losses. Research in the Botany Department has led to practices through which diseases are prevented. Basic research at USU on virus diseases of plants has resulted in contributions that have brought world-wide recognition to the Botany Department.

Current projects include; plant disease survey; breeding tomatoes for resistance to curly top and wilt; the nature and behavior of stone and pome fruit viruses; spectral analysis of plant virus infection processes; virus and virus-like diseases of stone and pome fruits; and biochemical studies of induced differential host response to virus infection.

## Undergraduate Study

Education for future professional work in Botany is the primary objective of the Botany curriculum.

Students should have thorough undergraduate training in Botany, supported by Chemistry, Mathematics, Physics, and related biological sciences. If graduate study beyond the Master of Science degree is planned, a reading knowledge of at least one foreign language should be acquired. Employment is found in universities and colleges, the U.S. Department of Agriculture, State Agricultural Experiment Stations, and in industry. This curriculum also provides excellent training for students who desire to become teachers of biological sciences in high schools and colleges.

In addition to the general University group requirements for the BS degree, students should take Biology 15; Botany 26, 102, 116, 117, 120, 130, 240; Chemistry 20, 21, 22, 121, 122; Math 35, 46; Zoology 112. Strongly recommended are Bacteriology 10 or 70 and Zoology 16. Under exceptional circumstances some upper division Botany classes may be substituted for one of the classes above, and Chemistry 10, 11 and 12 may be substituted for the Chemistry.

To supplement the foregoing courses, students with their adviser should select additional courses from the following recommended courses for fields of specialization.

Cytogenetics: Botany 118, 150; Zoology 132.

Plant Pathology and Virology: Botany 125, 150; Applied Statistics 51, 131, 132; Entomology 108, 130; Plant Science 131; Math 96, 97, 98, 99; Physics 17, 18, 19.

Plant Physiology: Chemistry 101, 115, 190; Math 96, 97, 98, 99, 110; Physics 17, 18, 19; Physiology 130; Range Science 126; Soils 105; Zoology 127.

Taxonomy: Botany 104, 108, 112, 118, 125, 150; German 1, 2, 3; Range Science 126; Soils 56; Zoology 107, 132.



## Graduate Study

**Master of Science Degree.** The Department of Botany offers the Master of Science degree in the following specialized fields: Cytogenetics, Plant Pathology, Plant Physiology, Plant Ecology, Taxonomy, Virology. Graduate studies are also offered in the Interdepartmental Curriculum in Plant Nutrition and Biochemistry. The opportunities and facilities for research in these fields are greatly augmented through the cooperation of the USU Agricultural Experiment Station, United States Agricultural Experiment Station, United States Department of Agriculture, and the Intermountain Herbarium.

In most cases a candidate must submit a thesis on a topic within the field of his major subject; however, with the approval of the major professor, the thesis alternate ("Plan B") may be substituted for the thesis if the candidate's primary aim is preparation for teaching with the Master's degree.

**Doctor of Philosophy Degree.** The Department of Botany, in cooperation with related departments, offers the degree of Doctor of Philosophy in the specialized fields of Plant Pathology, Plant Physiology, Plant Ecology, Taxonomy, Virology, and the Interdepartmental Curriculum in Plant Nutrition and Biochemistry. Detailed information may be obtained from the Department.

## Biology Courses

**1. Principles of Biology.** Study of the basic principles of life as illustrated in both plants and animals, including microbes. Four lectures, one recitation, one lab. (5F, W) **Palmblad**

**15. General Biology.** A study of the structures and functions that are common to living things. Cellular and molecular processes are emphasized. A knowledge of high school chemistry is assumed. This course is a prerequisite to all other botany courses in the Botany Department except Biology 1. Five lectures, one lab. (5F, W, Sp) **Baker, Palmblad, Shaw**

**100. Evolution, Ecology, and Man.** Inspection of selected biological phenomena with emphasis on their social implications. Basic evolutionary and ecological principles are presented to provide insight to students concerned with the fate of the human ecosystem. Prerequisites: Biology 1 or Biology 15 and upper division standing. Introductory psychology, anthropology, and sociology are recommended. Three lectures, one conference. (4W) **Palmblad**

## Botany Courses

**26. Elementary Botany.** A survey of the plant kingdom. Emphasis on comparative morphology, reproductive processes and evolution of representatives of the major groups of plants. Seed plants receive special attention as to form and function. Three lecture, one lab. (5W, Su) **Eker, Shaw**

**102. Taxonomy of Vascular Plants.** The kinds, relationships, and classifications of vascular plants, chiefly of this region. Assumes a knowledge of fundamental principles of botany. Three lectures, two labs. (5Sp, St) **Holmgren, Shaw**

**\*104. Evolution of Cultivated Plants.** Origin, evolution and distribution of certain selected plants which are of economic importance to man. Prerequisites: Botany 26, 112, Zoology 112 or equivalent. Lectures, readings and student reports. (3F) **Shaw**

**108. Agrostology.** A taxonomic study of native and imported grasses of western ranges. Special attention is given to species important in grazing and soil binding. Assumes a knowledge of fundamental principles of botany. Two lectures, two labs. (4F) **Holmgren**

**112. Aquatic and Marsh Plants.** A taxonomic and ecological study of aquatic and marsh plants. Emphasizes important food and cover plants for wildlife. Assumes a knowledge of the fundamental principles of botany. Two lectures, two labs. (4F) **Holmgren**

**116. Microtechnique.** Principles and methods in preparation of plant materials for microscopic study; efficient use of the microscope. Assumes a knowledge of fundamental principles of botany. (4F) **Boyle**

**117. Anatomy.** Structure and development of major cell types and tissues; comparative anatomy of the stem, root, and leaf of seed-bearing plants. Assumes a knowledge of fundamental principles of botany. Two lectures, two labs. (4W) **Boyle**

**118. Cytogenetics.** The structure, functions and modifications of chromosomes and their relationship to genetic phenomena. The laboratory emphasizes plant materials. Prerequisite: Zoology 112. Three lectures, two labs. (5Sp) **Boyle**

**120. Elementary Plant Physiology.** The principal physiological processes of plants, including water relations, synthesis and use of foods, and growth phenomena. Prerequisites: Biology 15 and Chemistry 12. (Chemistry 12 may be taken concurrently.) Four lectures, one lab. (5W, Sp) **Wiebe**

**\*121. Water Relations of Plants.** Factors affecting the availability of water, its absorption and use in plants, and the effects of water deficits on plant processes. Prerequisite: Botany 120. (3W) **Wiebe**

**\*125. Morphology of Vascular Plants.** Structure, development, reproduction, and evolution of the classes and orders of vascular plants. Prerequisites: Biology 15, Botany 26 and 102. Three lectures, two labs. (5F) **Shaw**

**130. Principles of Plant Pathology.** Fundamental principles underlying disease in plants. The types of disease and methods of study give the student a comprehensive view of plant pathology. Assumes a knowledge of botany fundamentals. Three lectures, two labs. (5F) **Cannon**

**\*140. Forest Pathology.** Nature, cause and control of disease affecting forest trees. Factors inducing loss in forest products are emphasized. Prerequisites: Biology 15 and Botany 26. Three lectures, one lab. (4Sp) **Cannon**

**150. Mycology.** Comparative morphology and nuclear behavior of the fungi. A summary of the field with special attention given forms important in agriculture, medicine, and industry. Prerequisite: Botany 26. Three lectures, two labs. (5F) **Baker**

**160. Fresh-Water Algae.** The morphology and identification of the fresh-water algae, with special emphasis to be given to the identification of local materials. Two lectures, two labs. (4Sp) **Baker**

**200. Evolutionary Ecology.** Synthesis of evolutionary and ecological theory with emphasis on the action of selection on natural populations. Prerequisites: Plant Ecology or Animal Ecology, or consent. Genetics and Mechanics of Evolution suggested. Two lectures, one conference. (3F) **Palmblad**

**212. Advanced Plant Taxonomy.** A course designed to consider traditional and recent techniques of collecting and synthesizing taxonomic data. Emphasis will be placed on evolu-

tion of taxa. Prerequisite: Botany 102. Three lectures, one lab. (4Sp) **Holmgren, Shaw**

**\*224. Plant Growth and Development.** Growth processes, with emphasis on hormones, photoperiod, dormancy. Prerequisite: Botany 120. (3W) **Wiebe**

**225. Mineral Nutrition of Plants.** Physiological and biochemical processes involved in the mineral nutrition of higher plants. Consideration will be given to specific roles of each nutrient in plant growth and metabolism. Prerequisite: Botany 120. Three lectures, one lab. (4F) **Miller**

**\*226. Plant Virology.** Physical and chemical properties of viruses and their biological relationships. Prerequisite: Botany 120. (3W) **Welkie**

**\*227. Plant Respiration and Metabolism.** A study of the oxidative breakdown of certain organic substances normally present in plant cells. The mechanisms by which sugars are respired to  $\text{CO}_2$  and  $\text{H}_2\text{O}$  and the interrelationships between this process and various others. Prerequisite: Plant Physiology 120. Three lectures, one lab. (4Sp) **Miller**

**\*228. Photosynthesis in Higher Plants.** Elucidation of the chloroplast structure and the various mechanism of photosynthesis: photolysis, electron transfer, chlorophyll excitation, photosynthetic phosphorylation, carbon dioxide fixation, and the influence of environmental factors on photosynthesis. Prerequisite: Consult instructor. Three lectures, one lab. (4Sp) **Miller**

**230. Field Plant Pathology.** A survey of plant diseases as they occur in Utah. The course includes the identification of diseases, conditions leading to their development, and the formulation of practices leading to their control. Field trips and laboratories. Prerequisite: Botany 120. (3Su) **Cannon**

**234. Special Problems.** Individual instruction. Credit arranged. (F, W, Sp, Su) **Staff**

**240. Seminar.** (1F, W) **Staff**

**241. Plant Physiology Seminar.** (1Sp) **Staff**

**250. Research.** Conduct special research in plant cytology, pathology, physiology, or taxonomy. Individual instruction. Credit arranged (F, W, Sp, Su) **Staff**

\*Taught 1968-69

\*\*Taught 1969-70

*Department of*

# Chemistry

**Head:** Professor Melvin C. Cannon  
Office in Chemistry 112

**Professors** Delbert A. Greenwood, Garth L. Lee, Grant Gill Smith, Jack T. Spence, Harris O. Van Orden; **Associate Professor** William M. Moore; **Assistant Professors** Terry D. Alger, Richard C. Anderson, Bruce Burnham, Thomas M. Farley, Richard K. Olsen, James W. Sinclair.

**Degrees:** Bachelor of Arts (BA), Bachelor of Science (BS), Master of Science (MS), Doctor of Philosophy (PhD)

**Majors:** Chemistry, Biochemistry.

Out of the early interest in Chemistry at USU has grown a strong, well organized Department of Chemistry with new laboratory facilities. It is accredited by the American Chemical Society, and its graduates find ready acceptance in graduate schools and employment in industry.

**Special Chemistry Opportunities.** The department participates in a National Science Foundation program which recognizes high scholarship by providing research opportunities and scholarships to superior Sophomore, Junior, and Senior students. Seminars are conducted for undergraduates, and an active student section of the American Chemical Society provides professional and social activities.

The Chemistry Department has acquired over \$400,000 worth of specialized equipment for research and teaching. In each course the student is introduced to new apparatus and instrumentation.

## Undergraduate Study

**Major:** The degree of Bachelor of Science in Chemistry is a professional degree. Graduates who meet the requirements of the American Chemical Society, by which the department is approved, and who fill

the requirements of the University as given in this catalog, will be certified by the Society. The degree of Bachelor of Arts in Chemistry is offered for those desiring more flexibility in the academic program. Graduates with the Bachelor of Arts degree will not be certified by the American Chemical Society. Each major must attain at least a 2.25 grade point average in Chemistry, Physics, and Mathematics to qualify for graduation.

A reading knowledge of German is required for the BS degree. This requirement is normally satisfied by the completion of German 1, 2, and 3. Two years of a foreign language are required for the BA degree. It is in the student's interest to fulfill this requirement as soon as possible.

The following courses in Chemistry are required for the BS degree and the following courses must be included: Chemistry 20, 21, 22, 121, 122, 123, 123A, 104, 105, 106, 109, 110, 111, 115, 150, 151, 153, 160. Courses 198 and 199 are recommended. This includes six credits of advanced courses which may be selected from the following courses: Chemistry 134, 190, 191, 192, 201, 202, 203, 204, 225, 226, 227, 250, 251, 272, 287, 295; Physics 122; 130; Math 140, 141, 142. Prerequisites necessary during the

program are Physics 20, 21, 22, and Math 96, 97, 98, 99, 110.

A minimum of 45 credits in Chemistry is required for the BA degree and the following courses must be included: Chemistry 20, 21, 22, 121, 122, 123, 123A, 104, 105, 106, 109, 110, 111, 115. Prerequisites necessary during the program are: Physics 20, 21, 22; Math 96, 97, 98, 99, 110.

**Minor:** A minimum of eight credits of upper division Chemistry courses is required for an approved minor in Chemistry. Suggested courses which will meet these requirements are: Chemistry 101, 115, 121, 122, 180 or 190.

**Teaching Major:** A teaching major in Chemistry requires the completion of the following minimum program: Chemistry 20, 21, 22, 101, 115, 121, 122 and 180. Supporting courses to be taken are Physics 17, 18, 19 and Math 35, 44, 96, 97, 98, 99. For a composite teaching major in Physical Science, the following minimum schedule is recommended: Chemistry 20, 21, 22 or 121, 101 or 180; Physics 17, 18, 19, 122, 130, 131 or 140; Math 46, 96, 97, 98, 120 or 150; Philosophy 50 or 160. Required professional education courses for the teaching certificate are listed by the College of Education.

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.

A better preparation for the teaching of chemistry is possible with a combined BA degree and teaching certificate.

Suggested curricula for BA and BS degrees in Chemistry:

## Lower Division

### FRESHMAN YEAR

Courses	Credits		
	F	W	Sp
Chemistry 20, 21, 22	5	5	5
Math 46, 96, 97	5	5	5
English 1, 2, 3	3	3	3
MS, AS, or PE	1	1	1
Electives	3-5	3-5	3-5
	17-19	17-19	17-19

### SOPHOMORE YEAR

Courses	Credits		
	F	W	Sp
Chemistry 121, 122, 123, 123A	4	4	5
Math 98, 99, 110	5	5	5
Physics 20, 21, 22	5	5	5
Electives	0-4	0-4	0-4
	14-18	14-18	15-19

## Upper Division

### JUNIOR YEAR

Courses	Credits		
	F	W	Sp
Chemistry 104, 105, 106	3	3	3
Chemistry 109, 110, 111	1	1	1
Chemistry 115, 153 <sup>1</sup>	4	3	
<sup>1</sup> Chemistry 150, 151	2	2	
Electives	5-8	6-9	11-14
	15-18	15-18	15-18

### SENIOR YEAR

Courses	Credits
Advanced courses <sup>1</sup> .....	6
Chemistry 160 <sup>1</sup> .....	1
<sup>1</sup> Chemistry 198, 199 (or elective) .....	3
Electives .....	32-41

## Graduate Study

**Entrance Examinations.** All entering graduate students must pass entrance examinations in Analytical, Inorganic, Organic and Physical Chemistry within one year of the date of initial registration. These examinations will be administered quarterly.

**Master of Science Degree.** The Chemistry Department offers the Master of Science degree with research in any one of the following fields: Analytical, Biological, Inorganic, Organic, and Physical Chemistry.

**Doctor of Philosophy Degree.** The Chemistry Department offers

<sup>1</sup>Not required for BA degree.

advanced study and research leading to the degree of Doctor of Philosophy in Chemistry. Before admission to candidacy the student must fulfill the following requirements: 1) Pass the entrance examinations, 2) demonstrate a reading comprehension of German and of Russian or French, 3) pass a comprehensive examination in a field of specialization and in two minor fields of chemistry, not later than one academic year before the final examination on the thesis, 4) present an acceptable statement of a thesis problem. The student should consult the School of Graduate Studies or the head of the department concerning other requirements.

**Interdepartmental Programs.** Graduate programs leading to MS and PhD degrees in Nutrition, Biochemistry, and Toxicology are available in cooperation with other departments giving courses in these areas. Detailed information may be found in this catalog under the School of Graduate Studies.

## Chemistry Courses

**10, 11. General Chemistry.** Principles of inorganic chemistry. Prerequisite: One unit of high school or college algebra. Four lectures, one lab. (5F, 5W or 5W, 5Sp) **Staff**

**12. Elementary Organic Chemistry.** An introduction to organic chemistry. Designed to follow Chem. 11 and completes a one-year terminal course in chemistry. Four lectures, one lab. (5F, 5Sp) **Staff**

**20, 21, 22. Chemical Principles and Qualitative Analysis.** (Formerly Chem. 3, 4, 5) Introduction to chemical theory and principles of chemistry, including introductory qualitative analysis. For science majors, pre-medical and pre-dental students and those who will take additional chemistry courses. Prerequisites: two of the following high school courses: advanced algebra, chemistry, physics or equivalent. Four lectures, one lab. (5F, 5W, 5Sp) Three lectures, two labs. (5Sp) **Lee**

**31. Physical Science.** Principles of chemistry essential to understanding the physical universe integrated for use in interpreting human experience. Intended to help meet the physical science group requirements. Three lectures. (3F, 3Sp) **Staff**

**101. Elementary Physical Chemistry for Biologists.** A lecture survey of basic quantitative laws governing chemical processes, applied to examples of biological interest. Mathematical derivations are kept to a minimum. Recommended as a prerequisite for those interested in biological or medical research. Prerequisites: Chem. 22, Math. 35 or equivalent. Four lectures. (4Sp) **Staff**

**104, 105, 106. Physical Chemistry.** Quantitative methods for solving problems in chemical thermodynamics, phase change, electrochemistry, reaction kinetics, quantum theory, and molecular structure. Prerequisites: Chem. 22, Physics 22, Math. 110. Three lectures. (3F, 3W, 3Sp) **Alger, Moore, Sinclair**

**109, 110, 111. Experimental Physical Chemistry.** Laboratory work correlated with Chem. 104, 105, 106. (1F, 1W, 1Sp) **Alger, Moore, Sinclair**

**115. Quantitative Analysis.** Basic theory and laboratory practice in gravimetric and volumetric analysis. Prerequisite: Chem. 22, Math 35. Two lectures, two labs. (4F) **Cannon**

**116. Inorganic Preparations.** A laboratory course in practical methods of synthetic inorganic chemistry. Prerequisites: Chem 22, 111. **Staff**

**121, 122. Organic Chemistry.** Fundamentals of the chemistry of carbon compounds. Prerequisite: Chem. 22. Three lectures, one lab. (4F, 4W) **Staff**

**123. Organic Chemistry** A continuation of Chem 121 and 122 for chemistry majors and others desiring an intensive lecture course in organic chemistry. Prerequisite: Chem. 122. Three lectures. (3Sp) **Staff**

**123A. Organic Chemistry Laboratory.** Laboratory to accompany Chem. 123. Two labs. (2Sp) **Staff**

**134. Qualitative Organic Analysis.** The classification, reactions and laboratory work involved in the identification of unknown organic compounds. Prerequisites: Chem. 123, 106. (4Sp) **Anderson, Olsen, Smith**

**150, 151. Inorganic Chemistry.** Study of the elements, compounds and bonding theories based upon the atomic structure. Prerequisite: Chemistry 104. Two lectures. (2F, 2W) **Staff**

**153. Instrumental Analysis.** Theory and application of physico-chemical methods of analysis. Selected electrochemical and optical methods. Prerequisites: Chem. 106, 115. Two lectures, one lab. (3W) **Spence**

**155. Glass Blowing.** A laboratory course in the technique of manufacturing and repairing laboratory glassware. Alternate years. (2W) **Staff**



160. Undergraduate Seminar. (1W) Staff

180. **Elementary Biochemistry.** A brief survey of the chemistry of biologically important compounds such as carbohydrates, lipids, proteins, nucleic acids and enzymes including their role in animal and plant metabolism. Qualitative and semi-quantitative experiments with important compounds are performed. This is a terminal course normally not intended to meet requirements for more advanced work in biochemistry. Prerequisites: Chem 22, 121. Four lectures, one lab. (5Sp) **Burnham, Farley**

190. **Principles of Biochemistry.** A study of the chemical and physical behavior of biologically important compounds including the chemistry of carbohydrates, lipids, proteins and hormones with an introduction to enzymatic processes, bioenergetics and metabolism. Prerequisites: Chem 101 or 106, and 122. Four lectures, one lab. (5F) **Burnham, Farley**

191, 192. **Principles of Biochemistry.** Chemistry of life processes including acid-base phenomena, enzyme catalyzed reactions, bioenergetics, oxidation-reduction, biosynthetic phenomena and the metabolism of biologically important compounds. Prerequisite: Chem 190. Students completing Chem 180 may register with special permission. Three lectures. (3W, 3Sp) **Burnham, Farley**

193, 194. **Biochemistry Laboratory.** Laboratory experiments illustrating general principles in studying biological materials. To accompany Chem 191 and 192. Prerequisite: Chem 190 (or special permission). Chem 115 advisable. Two labs. (2W, 2Sp) **Burnham, Farley**

195. **General Pharmacology.** Lectures and laboratory work dealing with principles, clinical application and research methods. Prerequisites: Chem 190, 122. Three lectures, two labs. (5W) **Greenwood**

198. **Undergraduate Research Problems.** Credit arranged. (F, W, Sp) **Staff**

199. **Undergraduate Thesis.** (1F, 1W, 1Sp) **Staff**

201. **Quantum Chemistry.** Quantum chemistry with emphasis on valence bond and molecular orbital calculations. Prerequisites: Chem 106, Math 110. Three lectures. (3F) **Alger, Moore, Sinclair**

202. **Molecular Spectroscopy and Structure.** Theory and applications. Prerequisite: Chem 201. Three lectures. (3W) **Alger, Moore, Sinclair**

203. **Chemical Kinetics.** Theory of reaction rates with application to current research problems. Prerequisite: Chem 201. Three lectures. (3Sp) **Alger, Moore, Sinclair**

\*204. **Chemical Thermodynamics and Statistical Mechanics.** Advanced chemical thermodynamics from the standpoint of Gibbs. Prerequisites: Chem 106, Math 110. Three lectures. (3F) **Staff**

\*205. **Chemical Thermodynamics and Statistical Mechanics.** Introduction to statistical mechanics. Prerequisites: Chem 201, 204. Three lectures. (3F) **Staff**

\*206. **Chemical Thermodynamics and Statistical Mechanics.** Applications of thermodynamics and statistical mechanics to chemical problems. Prerequisite: Chem 205. (3Sp) **Staff**

209. **Special Topics in Physical Chemistry.** Prerequisites: Chem 203, Math 110. (3) **Staff**

225, 226, 227. **Advanced Organic Chemistry.** Mechanism, structure and synthesis in organic chemistry. Prerequisites: Chem 106, 123. Three lectures. (3F, 3W, 3Sp) **Anderson, Olsen, Smith**

228. **Physical Organic Chemistry.** Quantitative aspects of organic theory including kinetics and equilibrium studies. Prerequisites: Chem 201, 226. Three lectures. (3W) **Anderson, Olsen**

229. **Theoretical Organic Chemistry.** Application of kinetics, thermodynamics and simple quantum mechanics to problems of organic chemistry. Prerequisite: Chem 228. Three lectures. (3Sp) **Smith**

\*233. **Special Topics in Organic Chemistry.** Current topics in organic chemistry. Prerequisite: Chem 227. Three lectures. (3F) **Anderson**

\*\*234. **Chemistry of Natural Products.** Alkaloids, steroids and terpenes with emphasis on biosynthesis. Prerequisite: Chem 227. Three lectures. (3F) **Staff**

250. **Advanced Inorganic Chemistry.** Modern topics and theories in inorganic chemistry. Prerequisites: Chem 106, 150. Three lectures. (3W) **Staff**

\*251. **Coordination Chemistry.** Theory of the coordinated bond and inorganic reaction mechanism. Prerequisite: Chem 250. Three lectures. (3Sp) **Staff**

260. **Graduate Seminar.** (1F, 1W, 1Sp) **Staff**

272. **Advanced Analytical Chemistry.** Modern developments in analytical chemistry. Prerequisites: Chem 106, 152, 153. Three lectures. (3Sp) **Spence**

274. **Special Topics in Analytical Chemistry.** Prerequisites: Chem 106, 152, 153. (3) **Staff**

280. **Toxicology.** Effect of selected chemical compounds on living organisms. Prerequisites: Chem 122, 190, 195. Three lectures, two labs. (5Sp) **Greenwood**

286. **Advanced Biochemical Research Techniques.** Modern experimental techniques of biochemical research. Prerequisite: Chem 194. Two labs. (Arr) **Staff**

\*Taught 1968-69

\*\*Taught 1969-70

**\*287. Nucleic Acids and Proteins.** Physical chemistry of macromolecules. Structures of nucleic acids, proteins, and viruses. The relation of biological activity to structure. Prerequisites: Chem 106, 192. Three lectures. (3Sp)

**Staff**

**288. Special Topics in Biochemistry.** Three lectures. (3)

**Staff**

**289. Animal Metabolism.** Feeding experiments involving development of amino acid, vitamin, mineral, and other nutritional deficiencies in blood, urine and other secretions and excretions when indicated. Credit arranged. (F, W, Sp)

**Greenwood**

**\*295. Enzymes.** Enzymes and their functions in plants and animals. Prerequisites: Chem 106, 192. Three lectures. (3W)

**Burnham, Farley**

**\*296. Enzyme Chemistry Laboratory.** The experimental methods of enzyme chemistry including the purification, assay, and isolation of enzymes followed by a study of their kinetics, activity and other properties. Prerequisites: Chem 106, 194. Two labs. (2Sp)

**Burnham, Farley**

**298. Graduate Research.** Credit arranged.

(F, W, Sp)

**Staff**

**Nutrition and Biochemistry Seminar.** (See Animal Science 270.)

\*Taught 1968-69

## Department of

# Geology

**Acting Head: Professor Clyde T. Hardy**  
Office in Main 258

**Professor Emeritus J. Stewart Williams; Associate Professor Donald R. Olsen; Assistant Professors Raymond L. Kerns, Jr., Robert Q. Oaks, Jr.**

**Degrees:** Bachelor of Science (BS), Master of Science (MS).

**Major:** Geology.

The geologic setting of USU offers opportunities for geologic studies scarcely equalled elsewhere in the country. A variety of geologic structures, rock types, erosional and depositional features of running water and glaciers, fossil types, ground water, mass wasting, in short, a magnificent display of features of geologic interest, may be seen within a few miles of the campus. The campus is within driving distance of metamorphic and igneous rock terrains. An easy drive will bring the student to a variety of mineral and rock materials.

USU campus is built in a delta of ancient Lake Bonneville, a site offering a rich field of investigation in lacustrine deposits and

Pleistocene geology. The Bear River mountain range, known for the thick and almost complete section of Paleozoic formations, rises to the east of the campus.

The Department of Geology is staffed by a small but competent group of geologists with widely varying backgrounds and interests.

The department offers courses for both non-science and science majors. Introductory courses in Physical Geology and in Physical-Historical Geology, with or without laboratory periods, satisfy the needs of students in many different fields. Undergraduate courses designed for Geology majors emphasize geologic forces and the principles of stratigraphy and sedimentation, structure, mineralogy,

petrology, paleontology, surficial geology, and field geographic methods.

In Geology, as in many other sciences, it is becoming necessary for the student to take a graduate degree. The department offers the MS degree and there is no foreign language requirement for this degree.

**Geology Club.** The Geology Club, under general supervision of the department, is an organization for all Geology majors.

## Undergraduate Study

**Bachelor of Science Degree.** For a major in Geology the following courses are required: Applied Statistics 51; Chemistry 10, 11; Civil Engineering 81; English 111; Geology 3, 101, 106, 107, 108, 110, 111, 113, 114, 115; Industrial and Technical Education 80; Math 35, 46, 96; Physics 17, 18, 19; and Zoology 16. Recommended are Art 57; Civil Engineering 181; German 1, 2, 3; Math 97, 98, 99; and Physics 20, 21, 22.

## Graduate Study

**Master of Science Degree.** The Department of Geology offers advanced study and research leading to the Master of Science degree. Graduate students of other departments may take any course in the 100 series for credit.

## Geology Courses

1. **Introductory Geology.** For students in non-science areas. (5F, W, Sp) **Staff**
3. **Physical Geology.** For majors in Geology, Forest Science, Range Science, Engineering, Soil Science and other sciences. (5F, W, Sp) **Olsen**
4. **Historical Geology.** Physical history of the earth and the development of life as indicated by the geologic record. (5F, W, Sp) **Staff**
31. **Physical Science.** (3F, W) **Staff**
101. **Mineralogy.** Identification of minerals by physical and chemical tests. Elementary crystallography. Prerequisites: Geology 3, Chemistry 10, 11. (5F) **Olsen**
102. **Optical Mineralogy and Petrography.** Determination of minerals by using the petrographic microscope. Classification of igneous rocks. Prerequisites: Geology 101, Physics 19. (3W) **Olsen**
103. **Engineering Geology.** Application of geology to engineering problems. (3Sp) **Hardy**
105. **Sedimentary Geochemistry.** Origin of sedimentary rocks with emphasis on chemical environment. (3Sp) **Kerns**
106. **Invertebrate Paleontology.** Introduction to the study of invertebrate fossils. Methods of preparation. Prerequisites: Geology 4, Zoology 16. (5Sp) **Williams**
107. **Minerals and Rocks.** Identification of rocks and rock-forming minerals. Prerequisite: Geology 3. (3F) **Olsen**
108. **Stratigraphy and Sedimentation.** Prerequisite: Geology 3. (5W) **Hardy**
109. **Sedimentary Petrology.** Classification and origin of sedimentary rocks with emphasis on mineral composition. Prerequisite: Geology 101. (3F) **Kerns**
110. **Structural Geology.** Prerequisite: Geology 3. (5F) **Hardy**
111. **Petroleum Geology.** Accumulation and origin of petroleum. Subsurface methods utilized in exploration. Prerequisites: Geology 108, 110. (3W) **Oaks**
113. **Economic Geology.** Theories of mineral deposition. Genetic classification of mineral deposits. Geologic and geographic occurrence of metallic and non-metallic mineral deposits. Prerequisites: Geology 101, 110. (5Sp) **Olsen**
114. **Geologic Field Methods.** Preparation of geologic and topographic maps utilizing the plane table. Measurement of stratigraphic sections. Prerequisites: Geology 3, Civil Engineering 81. (3Sp) **Hardy**
115. **Surficial Geology.** Processes active on surface of earth, unconsolidated deposits, and geomorphology. Recent geologic events. For majors in Forest Science, Range Science, Engineering, and Soil Science, Prerequisite: Geology 3. (5F) **Williams**
116. **Special Problems.** Directed study of selected topics. Written report required. (1-6F, W, Sp) **Staff**
117. **Ground-Water Geology.** Geologic conditions that control the occurrence and purity

of ground water with special reference to western United States. Prerequisite: Geology 3. (4W) **Williams**

118. **Geologic Field Course.** (8Su) **Staff**

130. **Photogeology.** Interpretation of aerial photographs in geologic mapping. Prerequisites: Geology 110, 115. (3F) **Oaks**

131. **X-Ray Mineralogy.** Principles and methods of mineral identification by X-ray diffraction. Prerequisite: Geology 101 (4F) **Kerns**

132. **Clay Mineralogy.** Structure and environmental significance of clay minerals. Prerequisite: Geology 131. (4W) **Kerns**

133. **Exploration Geophysics.** Principles of exploration geophysics with emphasis on seismic, gravity, and magnetic methods. Prerequisites: Geology 111, Physics 17. (3Sp) **Oaks**

134. **Geomorphology.** Quantitative and experimental approach to the study of land forms and associated sedimentary deposits. Emphasis on processes. Prerequisite: Geology 115. (3W) **Oaks**

200. **Sedimentary Petrography.** Classification and description of noncarbonate sedimentary rocks utilizing petrographic microscope. Prerequisite: Geology 102. (2W) **Kerns**

201. **Sedimentary Petrography.** Classification and description of carbonate sedimentary rocks utilizing petrographic microscope. Prerequisite: Geology 102. (2Sp) **Kerns**

210. **Graduate Seminar.** (2-5 F, W, Sp) **Staff**

212. **Paleoecology and Biostratigraphy.** (3F) **Oaks**

213. **Paleozoic Stratigraphy.** (3W) **Williams**

214. **Mesozoic and Cenozoic Stratigraphy.** (3W) **Hardy**

215. **Regional Tectonics.** (3F) **Hardy**

216. **Igneous and Metamorphic Petrography.** Classification and description of igneous and metamorphic rocks utilizing petrographic microscope. Prerequisite: Geology 102 (3Sp) **Olsen**

217. **Igneous and Metamorphic Petrology.** Origin of igneous and metamorphic rocks with emphasis on physical-chemical conditions and processes. Prerequisites: Geology 101, 107. (3F) **Olsen**

219. **Invertebrate Paleontology.** Taxonomic invertebrate paleontology exclusive of microfossils. Prerequisite: Geology 106 (3Sp) **Williams**

220. **Thesis.** (5-15 F, W, Sp) **Staff**

## Department of

# Mathematics

**Head:** Professor Neville C. Hunsaker  
Office in Engineering C-325

**Professor** Joe Elich; **Associate Professors** John E. Kimber, Mary Nelson, Konrad Suprunowicz; **Assistant Professors** Antone Bringham, Lawrence O. Cannon, Robert G. Hammond, L. Duane Loveland, R. G. Nath, Wendell L. Pope, Wayne R. Rich, Douglas F. Riddle, E. E. Underwood, J. D. Watson.

**Degrees:** Bachelor of Science (BS), Master of Science (MS).

**Majors:** Mathematics, Mathematics Teaching.

To some, the study of Mathematics is a deeply satisfying or wonderfully exhilarating experience—an end in itself. To others the study of Mathematics is a means whereby significant goals are attained. At USU you may enjoy the stimulation and inspira-

tion of association with very gifted and scholarly mathematicians while obtaining very secure fundamental training in areas of Mathematics that will open a large number of vocational opportunities.

In recent years there has been

an enormous growth of opportunity for non-academic employment of the mathematically competent. This is especially true for girls. Many girls have very special aptitude for the interesting and rewarding positions requiring mathematical skills and can qualify for these positions by completing good quality training in the mathematical sciences.

Two majors are offered by the Mathematics Department for the Bachelor of Science degree. Students intending to enter graduate study in Mathematics, those intending to teach Mathematics in a junior college or a university, and those expecting industrial employment as mathematicians take the regular major. Those intending to teach Mathematics in the secondary schools must satisfy the State requirements for secondary certification and must fill department requirements in one of two ways: 1) regular mathematics major, 2) a department approved teaching major.

Regular majors are required to complete Mathematics 110, 130, 131, 132 and fifteen additional credits of upper division Mathematics selected from courses 111, 116, 117, 118, 126, 127, 128, 134, 135, 136, 140, 141, 142, 145, 147, 148, 153, 161, 162, 163. Physics 20, 21, and 22 are required and nine credits of upper division Physics are recommended. Those students who are planning to study Mathematics at the graduate level should include at least one of the sequences Mathematics 116, 117, 118 or 134, 135, 136. They should also have a reading knowledge of French, German or Russian.

A department-approved teaching major must include Mathematics 40, 99, 120, 150, 151, 152, 175 and an additional nine credits of upper division Mathematics selected

from other courses meeting departmental approval.

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.

A department-approved teaching minor must include Mathematics 97 and 175. It must also include Mathematics 120 and 150 or department approved substitutes.

All students majoring in Mathematics must have had Plane Geometry, which is a prerequisite for all University mathematics except Mathematics 21, 22, 23, 30, 34, 35 and 60.

If a student completes both Mathematics 30 and 34, credit will be allowed for only one of these courses.

All courses to be used as prerequisites must be completed with a grade of "C" or better.

## Graduate Study

At USU you may qualify at the Master's degree level for industrial employment as a mathematician. (Starting salaries for those having an MS degree are about \$2,000 higher than for those with only the BS degree.) Students who obtain an MS degree in Mathematics frequently accept teaching positions in a junior college or small four year college. A considerable number of students qualify for high school teaching each year by completing the special curriculum recommended for teaching majors. See the Graduate School catalog for further information.

## Mathematics Courses

**0. Remedial Mathematics.** A non-credit course for those students whose performance on the mathematics entrance examination is below the acceptable minimum. (F, W) **Staff**



## 332 College of Science

**A. Remedial Algebra.** A non-credit course in elementary algebra for those students requiring preparation for mathematics courses carrying college credit. (F, W) **Staff**

**21, 22, 23. Mathematics For Elementary Teachers.** Basic mathematics for prospective teachers in the elementary schools, including an introduction to algebra and geometry. (3F, 3W, 3Sp) **Staff**

**30. Elements of Mathematics.** A survey course designed to help fill the science group requirements for students who are not planning to study more mathematics. Prerequisite: One year of high school algebra. (5F, W, Sp) **Staff**

**34. Introduction To College Algebra.** Beginning algebra course designed to develop skills and techniques of elementary algebra. In most cases, students with more than one year of high school algebra should not enroll in Math 34. (3F, W, Sp) **Staff**

**35. College Algebra.** The elementary algebra needed as prerequisite for Math 96. Prerequisite: Math 34. (5F, W, Sp) **Staff**

**40. Introduction To Probability Theory and Statistics.** A pre-calculus course in elementary probability theory and a brief introduction to statistics. Prerequisite: Math 35. (3F, W) **Staff**

**44. Plane Trigonometry.** For students who need trigonometry for applications but who will probably not study calculus. Prerequisite: Math 35. (3F, W, Sp) **Staff**

**46. Plane Trigonometry.** For students who need trigonometry as a prerequisite for Math 96. Prerequisite: Math 35. (5F, W, Sp) **Staff**

**60. Mathematics of Finance.** Prerequisite: Math 35. (3Sp) **Staff**

**66. Introduction to Mathematical Analysis.** Calculus and an introduction to linear analysis. Primarily for students of College of Business. Prerequisite: Math 35. (5W, Sp) **Staff**

**96, 97, 98, 99. Analytic Geometry and Calculus.** Analytic geometry in two and three dimensions together with elementary calculus including partial derivatives, multiple integrals and infinite series. Prerequisite: Math 46. (5F, 5W, 5Sp) **Staff**

**110, 111. Ordinary Differential Equations.** Study of elementary techniques used in finding solutions to ordinary differential equations. Prerequisite: Math 99. (3F, 3W, 3Sp) **Staff**

**116, 117, 118. Modern Algebra.** An introduction to abstract algebra including a study of groups, rings, theory of matrices, and linear transformations. Prerequisite: Math 99. (3F, W, Sp) **Staff**

**120. Modern Geometry.** An axiomatic development of Euclidean and non-Euclidean geometries. Prerequisite: Math 97. (3F) **Staff**

**123. Number Theory.** Elementary properties of integers, some arithmetical functions, congruences, and simple Diophantine equations. Prerequisite: Math 97. (3W) **Staff**

**124. Foundations of Mathematics.** Introduction to elementary set theory and a study of axiomatic systems in general. Prerequisite: Math 97. (3Sp) **Staff**

**126. Numerical Methods.** Survey of numerical methods used in finding zeros of functions, solutions of systems of equations, and curve fitting. Prerequisites: Math 99 and a knowledge of FORTRAN. (3F) **Staff**

**127, 128. Introduction to Numerical Analysis.** Extension of Math 126 with emphasis on numerical differentiation, integration, and solutions of ordinary differential equations. Prerequisite: Math 126. (3W, 3Sp) **Staff**

**130, 131, 132. Advanced Calculus.** Elementary theory of functions of real variables. Prerequisite: Math 110 or taken concurrently with Math 130. (4F, 4W, 4Sp) **Staff**

**134, 135, 136. Introduction To Topology.** Study of elementary point set topology. Prerequisite: Math 99. (3F, 3W, 3Sp) **Staff**

**140, 141, 142. Advanced Engineering Mathematics.** Differential equations and boundary value problems, Fourier Series, Laplace Transforms, Vector Analysis, and characteristic value problems. Emphasis is on applications. Prerequisite: Math 110. (3F, 3W, 3Sp) **Staff**

**145. Vector Analysis.** The algebra and calculus of vectors. Prerequisite: Math 99. (3F) **Staff**

**147, 148. Introduction To Complex Variables.** A first course in complex variables designed for physics and engineering students, and as a prerequisite for Math 254. Prerequisite: Math 130 or 140. (3W, 3Sp) **Staff**

**150, 151, 152. Mathematics for Secondary School Teachers.** Basic concepts of mathematics for prospective secondary school teachers with emphasis on mathematical systems and the system of real numbers. Prerequisite: Math 97. (3F, 3W, 3Sp) **Staff**

**153. Mathematical Readings.** Prerequisite: Math 99. (3) **Staff**

**160. Determinant and Matrix Theory.** An introduction to matrix analysis with emphasis on applications. Prerequisite: Math 98. (3F) **Staff**

**175. Teaching of Mathematics in the Secondary Schools.** A methods course required of all prospective secondary school teachers. Prerequisite: Math 150. (3Sp) **Staff**

**216, 217, 218. Topics in Abstract Algebra.**  
Prerequisite: Math 118. (3F) Staff

**220, 221, 222. Advanced Topics In Algebra.**  
Prerequisites: Math 216, 217, 218. (3F, W, Sp) Staff

**226, 227, 228. Numerical Analysis.** Prerequisites: Math 128, 132. (3F, W, Sp) Staff

**234, 235, 236. Topology.** Prerequisite: Math 132. (3F, W, Sp) Staff

**246. Tensor Analysis.** Prerequisite: Math 145. (3F) Staff

**247. Differential Geometry.** Prerequisite: Math 246. (3W) Staff

**248. Differential Geometry.** Prerequisite: Math 247. (3Sp) Staff

**250. Graduate Seminar.** Credit arranged. (F, W, Sp) Staff

**251, 252, 253. Real Variables.** Prerequisite: Math 132. (3F, W, Sp) Staff

**254, 255, 256. Theory of Functions.** Prerequisite: Math 132. (3F, W, Sp) Staff

**257, 258, 259. Advanced Applied Mathematics.** Prerequisite: Math 132. (3F, W, Sp) Staff

**260. Graduate Thesis.** Credit arranged. (F, W, Sp) Staff

## Mathematical Statistics

Students can get a Bachelor of Science degree in Mathematical Statistics. The work in Mathematical

Statistics has a three-fold purpose: 1) to train professional statisticians, 2) to instruct students who wish to broaden their mathematical studies in Economics, Sociology, Genetics, Biometry, Psychology and Education, 3) to conduct research in statistics and train competent consultants on statistical problems.

Mathematics 99 or its equivalent is required of all students taking statistics.

If students wish to major or minor in Statistics, they should take courses 160 to 167 inclusive in Statistics, plus Mathematics 110, 130, 131, and 132.

## Statistics Courses

**161. Calculus of Probability.** Prerequisite: Math 99. (5F) Staff

**162, 163. Mathematics of Statistics.** Including Math 161, a year's sequence in mathematical theory of probability, random variables on both discrete and continuous sample spaces, elementary sampling theory and hypothesis testing. Prerequisites: Math 160, 161. (5W, 5Sp) Staff

**166. Sequential Analysis and Control of Quality of Output in Manufacturing.** (3Sp) Staff

**167. Statistical Reading and Reports.** (3Sp) Staff

## Department of

# Physics

**Head:** Associate Professor W. Farrell Edwards  
Office in Engineering 154

**Professor** John K. Wood; **Associate Professors** Jack E. Chatelain, John J. Merrill, Akeley Miller; **Assistant Professors** Jay O. Jensen, V. Gordon Lind, Robert E. McAdams, O. Harry Otteson, William R. Pendleton.  
**Degrees:** Bachelor of Science (BS), Master of Science (MS), Doctor of Philosophy (PhD)

**Major:** Physics.

The basic science of Physics is devoted to understanding the many ways in which energy and matter interact in the universe.

Problem areas which have received attention in recent years are: the quantum theory of matter and radiation, elementary particle

physics, high energy physics, the theory of nuclear structure, and relativity theory. On the more practical side, physicists are involved in the development of nuclear energy, high speed electronic computers, atomic and thermonuclear weapons, and ballistic missiles.

At USU the objective of understanding the physical world is implemented by programs of study and research in both the theoretical and experimental areas. The undergraduate student studies mechanics, electricity and magnetism, optics, thermodynamics, modern physics, solid state physics, and relativity theory. Throughout the nation it appears that studies recently are more and more conducted in the near absence of professors. Here, however, a close relationship exists between the staff and the students. Also, the professors are up to date in their areas of research, both experimental and theoretical. This allows an early exposure of the undergraduate student to research conducted at USU in such areas as nuclear physics, high energy particles, and relativity theory.

### Undergraduate Study

A minimum of 50 credits in Physics is required for the BS degree. In addition to the basic sequence, Physics 20, 21, and 22 (15 credits total), a Physics major must complete at least 35 credits of upper division Physics which must include Physics 125, 126, 127, 181, 182, 183, and an approved Senior project (at least two credits in Physics 188). The undergraduate Physics curriculum includes Physics 153, 154, 155, 156, 157, 158, 175, 176, and 177 in addition to those listed above.

The following sequence of courses is recommended for students who

plan to do graduate work in Physics:

**Freshman Year:** Math 35, 96, 97; Chemistry 20, 21, 22; English 1, 2, 3; Physics 20 and group requirements. Students without adequate prerequisites should consult an adviser.

**Sophomore Year:** Physics 21, 22, 23; Math 98, 99, 110; German, Russian or other group electives.

**Junior Year:** Physics 153, 154, 155, 156, 157, 158; Math 130, 131, 132, or 140, 141, 142; Physics 104, 105, 106, 166, 167, 168, or electives.

**Senior Year:** Physics 104, 105, 106, 125, 126, 127, 160, 161, 162, 175, 176, 177, and 188.

**Minor:** A minor in Physics will be approved on completion of Physics 153, 154, 155, or Physics 175, 176, 177. Nine credits of upper division Physics courses including 122 and 130 may be substituted on departmental approval.

**Teaching Major:** For a teaching major in Physics, a student should complete the following programs: Physics 153, 154, 155, 181, 182 or 175, 176, 177, 181, 182 with prerequisites: Mathematics through 110. Required professional education courses for the teaching certificates are listed in the College of Education.

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.

### Biophysics

Students planning to pursue biophysics should write to either the Physics or Zoology Department for advisement since this is a graduate

program requiring a strong undergraduate program in Mathematics, Physics, and Biology.

## Graduate Study

**Master of Science Degree.** A candidate for the degree of Master of Science in Physics must take an entrance examination administered by the department prior to registration. A student may be required to register for one or more undergraduate courses in order to correct any deficiencies which appear upon analysis of the student's work on this examination. The candidate is also required to take a comprehensive examination, administered by the department, during the Spring Quarter of the student's first year of residence. This examination covers undergraduate and first-year graduate physics with an emphasis upon mechanics, electromagnetic theory and quantum mechanics, especially in its coverage of first-year graduate physics. A candidate is also required to complete at least two of the first-year graduate courses in these three subjects. In addition, the student will submit either a thesis or a research report at the discretion of the student's supervisory committee. A total of up to 15 credits may be accumulated toward the Master of Science degree credit requirements for the research work leading to the thesis or research report.

**Doctor of Philosophy Degree.** The Physics Department, in cooperation with related departments, offers the Doctor of Philosophy degree. A brief summary of the Philosophy Degree program in Physics includes the following: An entrance exam prior to registration; at least one year in residence at the Logan campus; a qualifying exam over undergraduate and first

year graduate physics during Spring Quarter of the first year; a comprehensive exam with emphasis on Quantum Mechanics, Electricity and Magnetism and Classical Mechanics usually at the completion of the second year; an examination conducted by the Language Department in German, French, or Russian; a thesis and a thesis defense, credit requirements are 135 credits and may include (in addition to recommended courses) up to 45 credits for the thesis, transfer credit (determined on an individual basis), and credit for preliminary thesis research.

## Physics Courses

**3. Introductory Physics.** A descriptive course for students not majoring in science or engineering. Fundamental physical principles will be presented with a minimum of algebra. (5F, W, Sp, Su) **Staff**

**6. General Physics.** A survey course in physics, with a laboratory. Covers fundamental physical principles with emphasis on how a problem is approached and solved in physics. (5F, W, Sp) **Staff**

**10. Astronomy.** An introduction to the solar and stellar systems in terms of modern methods and theories. (3F, W, Sp) **Staff**

**17, 18, 19. General Physics.** Mechanics, electricity, magnetism, heat, light, sound, atomic and nuclear physics for non-science majors. Prerequisite: Math 35 or Math 44 or 46. Recommended: Math 97. Should be taken in sequence except with permission of instructor. Two lectures, three recitations and one lab per week. (5F, 5W, 5Sp) **Staff**

**20, 21, 22. General Physics-Science.** Mechanics, electricity, magnetism, heat, light, sound, atomic and nuclear physics for science majors and engineers. Prerequisite: Math 96. Recommended: Concurrent registration in Math 97. To be taken in sequence except with permission of instructor. Two lectures, three recitations and one lab per week. (5F, 5W, 5Sp) **Staff**

**23. Quantum and Statistical Physics.** Further development of physical phenomena due to the quantum and/or statistical nature of matter. Prerequisite: Physics 22. (3Sp) **Staff**

**40. Introductory Mechanics I.** Introduction to Newtonian Mechanics with brief development of elementary calculus and vector algebra. Prerequisite: Permission of the instructor. (3F) **Staff**

**41. Introductory Mechanics II.** Development of concepts of energy and momentum, both linear and rotational, and the introduction of conservation laws. Further development of vector and calculus notations. Prerequisite: Physics 40. (3W) **Staff**

**42. Energy Transfer.** Wave motion, sound, and heat. Prerequisite: Physics 41. (3Sp) **Staff**

**50. Mechanics Laboratory.** Experiments on conservation of momentum and energy oscillatory motion, heat transfer, and gas laws. Prerequisite: Student must be concurrently registered in Physics 42. (1Sp) **Miller**

**60. Astronomy.** An introduction to astronomy and astrophysics for the student with some science and mathematics background. The solar system; the creation, evolution and death of stars; galaxies and cosmology. Prerequisites: Math 46, Physics 6. (3Sp) **Staff**

**104, 105, 106. Physics Colloquium.** A series of invited lectures on specialized topics in physics and related subjects. (1F, W, S) **Staff**

**122. Survey of Modern Physics I.** For Engineering, Science, and Teaching majors. (3W) **Jensen**

**125, 126, 127. Modern Physics.** Application of special relativity and quantum mechanics to atomic structure, molecular physics, solid state physics, X-rays and nuclear physics. Prerequisite: Physics 155 or 177. Three lectures, one recitation. (4F, W, Sp) **Staff**

**130. Nuclear Physics.** A survey of methods and results of recent investigations of nuclear processes. To follow Physics 122. (3Sp) **Staff**

**131. Nuclear Detection Methods.** Designed to familiarize the student with the instruments, techniques of measurement, and elements of health safeguards used in nuclear physics. (2F, W, Sp) **Staff**

**140. Biophysics I.** Foundations of physical measurements in biology with emphasis on optical methods: microscopy including phase and interference, spectroscopy, X-ray techniques, crystal analysis. Prerequisite: Physics 19 or 20. (3F) **Staff**

**141. Biophysics II.** Introduction to quantitative biology. The underlying physical principles involved in biophysical phenomena are discussed. Prerequisite: Physics 19 or 22. (3W) **Staff**

**143. Radiobiology.** Designed to acquaint students in Medical Technology, Botany, Zoology, pre-Medicine, pre-Veterinary and Agriculture with a foundation of techniques in health physics, radiation monitoring and measuring and isotope handling. Prerequisite: One quarter of general physics. (3) **Jensen**

**153, 154, 155. Analytical Mechanics.** Prerequisite: Differential equations. (3F, 3W, 3Sp) **Staff**

**156, 157, 158. Introduction to the Theory of Relativity.** An introduction to the foundations, formulation, and predictions of the special theory of relativity and applications to modern physics. Advanced courses in mechanics and electricity and magnetism are considered helpful but not necessary. (2F, 2W, 2Sp) **Staff**

**160, 161, 162. Thermal Physics.** A study of theoretical models devised to correspond with the observed behavior of matter in bulk in terms of heat and energy. (3F, 3W, 3Sp) **Staff**

**\*166, 167, 168. Wave Theory and Optics.** Three-quarter sequence covering optics and related topics. Emphasis on wave motion and diffraction phenomena; also geometrical optics, aberrations, interference, polarization, X-ray optics, and atomic spectra. Three lectures. (3F, 3W, 3Sp) **Staff**

**175, 176, 177. Electricity and Magnetism.** Electrostatics, magnetostatics, DC and AC circuits, electromagnetism, and electromagnetic theory. Use of the calculus and differential equations. (3F, 3W, 3Sp) **Staff**

**181. Mechanics Laboratory.** A one quarter course including experiments on linear and non-linear oscillatory motion with and without coupling and experiments on elastic behavior of bodies. Makes use of calculus and some differential equations. Prerequisite: Concurrent or previous registration in Physics 153. (1F) **Staff**

**182. Electricity and Magnetism Laboratory.** A one-quarter course including experiments with direct and alternating current bridges, experiments to examine the mechanical and electrical details of galvanometer and other meter behavior, and experiments concerning feedback and filter and other transfer properties. Makes use of calculus and some differential equations. Prerequisite: Concurrent or previous registration in Physics 175. (1W) **Staff**

**183. Atomic Physics Laboratory.** A one-quarter course including experiments in atomic physics such as the measurements of electronic charge by the Millikan oil drop experiment and the Franck and Hertz experiment. Makes use of calculus and some differential equations. Prerequisite: Concurrent or previous registration in Physics 153. (1Sp) **Staff**

**184. Optics Laboratory.** A one-quarter course including advanced experimental work in optics such as refraction in inhomogeneous media, diffraction, polarization, photometry, spectra, information retrieval. Prerequisite: Concurrent or previous registration in Physics 166. (1W) **Staff**



188. **Special Problems in Physics.** A laboratory course to give the advanced student experience with precision instruments and their use in physics, 1 to 3 per quarter. (F, W, Sp) **Staff**

193, 194, 195. **Seminar in Physics.** A weekly meeting of staff and Physics majors consisting of reports on recent developments in physics. Students receive credit for course by making reports. (1F, 1W, 1Sp) **Staff**

196, 197, 198. **Selected Reading in Physics.** (1F, 1W, 1Sp) **Staff**

Courses numbered above 200 may be taken by undergraduates only with the approval of the instructor and the head of the department.

200, 201, 202. **A study of the structure and properties of solids.** These include elastic, thermal, electric and magnetic properties. Considerable time is devoted to the study of conductors and semiconductors (especially germanium and silicon). Prerequisites: Physics 127, 177, and 162 or permission of the instructor. Concurrent registration in Physics 260 is recommended. (3F, W, Sp) (Offered alternate years.) **McAdams**

204, 205, 206. **Physics Colloquium.** A series of invited lectures on specialized topics in physics and related subjects. (1F, W, Sp) **Staff**

210, 211. **X-Ray Diffraction and X-Ray Crystallography.** (3F, 3W) **Staff**

220, 221, 222. **Atomic Spectra, Molecular Spectra, and Spectrographic Measurements.** (3F, 3W, 3Sp) **Staff**

230, 231, 232. **Nuclear Physics.** (3F, 3W, 3Sp) **Staff**

250. **Research in Physics.** Credit arranged. (F, W, Sp) **Staff**

260, 261, 262. **Thermodynamics, Kinetic Theory, Statistical Thermodynamics.** (3F, 3W, 3Sp) **Staff**

270, 271, 272. **Quantum Field Theory.** (3F, 3W, 3Sp) **Chatelain**

275. **Relativity and Cosmology.** A special theory of relativity developed from the Einstein postulates. The historical and experimental basis for the theory will be discussed, and necessary mathematical techniques will be developed with applications to relativistic mechanics. (3F) **Staff**

276. **Relativity and Cosmology.** The general theory of relativity developed from the principle of equivalence. The Reimann-Christoffel curvature tensor, the field equations, and the known rigorous solutions will be discussed. (3W) **Staff**

277. **Relativity and Cosmology.** Equations of motion in the general theory, experimental tests of the theory, possible unified field theories, and applications to cosmology. (3Sp) **Staff**

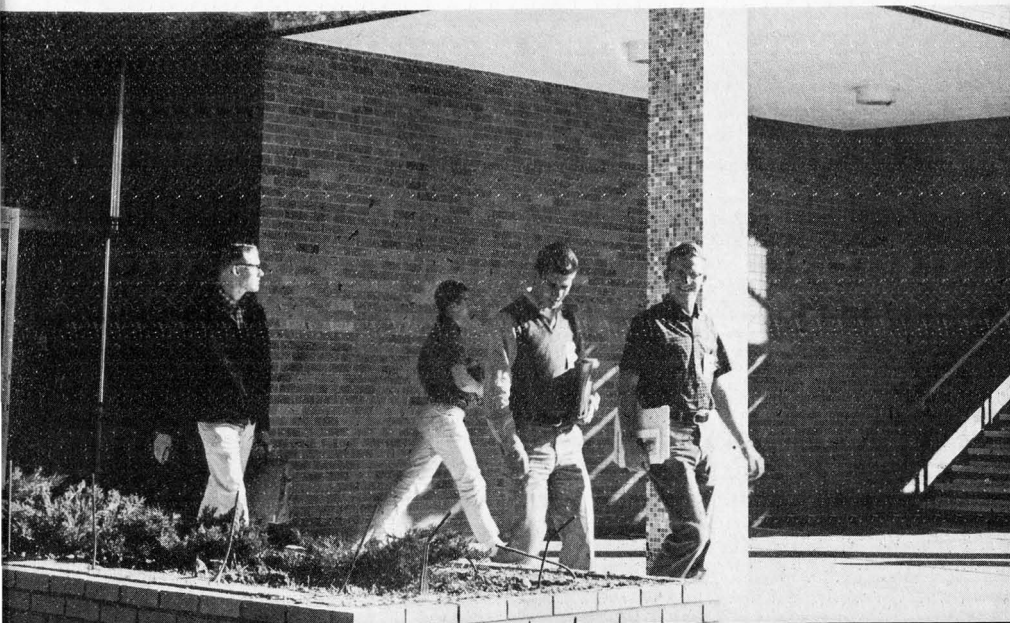
285, 286, 287. **Introductory Quantum Mechanics.** Prerequisite: Advanced Calculus. (3F, 3W, 3Sp) **Staff**

288. **Introductory Quantum Mechanics.** Continuation of 287. (3F) **Staff**

290, 291, 292. **Theoretical Mechanics.** (3F, 3W, 3Sp) **Staff**

293, 294, 295. **Graduate Seminar in Physics.** Advanced topics in physics on specialized subjects to specially train the student in his graduate research. Credit Arranged. (F, W, Sp, Su) **Staff**

296, 297, 298. **Theoretical Electricity and Magnetism.** (3F, 3W, 3Sp) **Staff**



Department of

# Zoology

**Head:** Professor Datus M. Hammond  
Office in Forestry and Zoology 119

**Professors** Thomas L. Bahler, Donald W. Davis, Keith L. Dixon, Eldon J. Gardner, George F. Knowlton, William F. Sigler; **Associate Professors** LeGrande C. Ellis, Warren C. Foote, Merrill H. Gunnell, Gene H. Linford, Raymond T. Sanders, John R. Simmons; **Assistant Professors** James T. Bowman, William A. Brindley, Wilford J. Hanson, Ting H. Hsiao, Reed S. Roberts, Hugh P. Stanley; **Collaborators** George E. Bohart, Thomas D. Crowe, Gerald D. Griffin, Edsel C. Jorgenson, William P. Nye, Heber F. Thornley, Philip F. Torchio.

**Degrees:** Bachelor of Science (BS), Master of Science (MS), Doctor of Philosophy (PhD).

**Majors:** Zoology, Entomology, Physiology, Pre-Dental and Pre-Medical combined curriculum.

The department includes Zoology proper, Entomology, and Physiology, plus the Pre-medical and Pre-dental programs. The department is housed in a new building of four floors, with fully equipped, spacious teaching and research laboratories.

**Zoology, Physiology Programs.** Majors in Zoology and Physiology obtain training in Mathematics, Physics, Chemistry and Botany, as well as Zoology and Physiology. The majority of positions open for persons with a BS degree in these subjects are in teaching. People with MS or PhD degrees are qualified for research and other positions in the federal government and in industry, as well as in university and college teaching.

**Entomology Program.** The Entomology division of the Zoology department is nationally recognized as one of the leading centers for undergraduate training. Majors in Entomology obtain training in Zoology, Botany, Agriculture, and the physical sciences, as well as Entomology, depending on indi-

vidual interests. There are career opportunities for entomologists with BS degrees as well as those with graduate training. Currently, the demand for entomologists exceeds the supply, especially at the PhD level. Entomologists with a BS degree are qualified for employment as representatives of insecticide companies, plant quarantine inspectors, and work in mosquito abatement, forest insect control, etc.

**Pre-Dental Program.** The Pre-Dental student may earn a BS degree before entering a dental school. However, he may enter a dental school after three years of Pre-dental work, in which case he may be graduated from USU by using his first year of dental school work to complete the USU graduation requirements.

**Pre-Medical Program.** The Pre-Medical program satisfies entrance requirements of medical schools in the United States and Canada. After four years the student receives a BS degree with a Pre-Medical major in Zoology. Or

he may, after completing three years here and one year at medical school, receive the BS degree from USU. During the past five years the acceptance rate of the Pre-medical students in USU's program has averaged 65 percent.

## Undergraduate Study

**For a major in Zoology**, the following courses must be taken: Biology 15, Zoology 16, 107, 112, 118, and 132; Physiology 121 and 122, or 130 and 151; Wildlife Resources 160, or any additional upper division course in Zoology; Botany 26; Mathematics 35 and 46; Physics 17, 18, and 19; Chemistry 20, 21, 22, 121, 122, and 123; and 15 credits of modern language. In order to be certified for graduation, the candidate must have a 2.2 average in the above courses. The following courses are recommended: Entomology 13 and 101, Bacteriology 70, a second year of a modern language, Philosophy 50 (Logic), Philosophy 160 (Philosophy of Science), English 34, 35, 36 or any upper division literature course; additional courses in History, Political Science, and Fine Arts. Students interested in experimental aspects of Zoology should elect more Mathematics (96, 97, 98, 99, and 110), more Chemistry (115 and 190) and Applied Statistics (131 and 132).

**For a Pre-Medical or Pre-Dental major in Zoology**, the listed pre-medical or pre-dental requirements must be completed, and in addition the following courses must be taken: Zoology 107, 127 or 128, 132, and any one of the following courses: Entomology 115, Physiology 130, Zoology 116 or 212. The departmental grade point average is required for graduation.

**For a major in Biophysics**. Students planning to pursue Biophysics should write to either the Phys-

ics or Zoology Department for advisement since this is a graduate program requiring a strong undergraduate program in Mathematics, Physics and Biology.

## Graduate Study

**Master of Science Degree.** The Zoology Department offers a Master of Science degree in various phases of Agricultural Entomology, Genetics, Medical Entomology, Systematic Entomology, Physiology, Parasitology, Mammalogy, Ornithology, and Herpetology.

**Doctor of Philosophy Degree.** Cooperatively with related departments, advanced study and research is offered for the attainment of the degree of Doctor of Philosophy in specialized fields of Zoology, Entomology and Physiology. Further information may be obtained from the department or from the Dean of the School of Graduate Studies.

## Biology Courses

**1. Principles of Biology.** A study of basic life principles as illustrated in both animals and plants, including microbes. Four lectures, one recitation, and one two-hour lab. (5F, W, Sp, Su) **Gunnell, Linford**

**15. General Biology.** A study of the structures and functions that are common to living things. Cellular and molecular processes are emphasized. A knowledge of high school chemistry is assumed. This course is a prerequisite to all other courses in the Zoology Department except Biology 1 and Physiology 4. Four lectures, one lab. (5F, 5W, 5Sp) **Staff**

## Zoology Courses

**16. General Zoology.** Study of the animal kingdom, with emphasis on comparative structure and function of the organ systems and on evolutionary relationships. Prerequisite: Biology 15. Three lectures, two labs. (5F, 5W, 5Sp) **Staff**

**31. Evolution.** A general consideration of the biological principles of evolution as they apply to plants, animals and man. Prerequisite: Biology 1, or a good high school course in biology. Three lectures. (3W) **Gunnell**

- 101. Invertebrate Zoology.** The more important phyla of invertebrates, with some consideration of the local fauna. Prerequisite: Zoology 16 or equivalent. Three lectures, two labs. (5Sp) **Staff**
- 107. History and Literature of Biology.** The more important men and ideas in the historical development of biology. (4F) **Gardner**
- 112. Principles of Genetics.** A beginning course dealing with the basic principles of genetics. Illustrative material is taken from animals, plants and man. Prerequisite: Zoology 16 or equivalent or Botany 26. Four lectures, one lab. (5F, W, Sp) **Staff**
- 116. Parasitology.** Protozoa and worms parasitic in man, domestic animals and wild animals, and relationships between parasites and their hosts. Prerequisite: Zoology 16 or equivalent. Three lectures, two labs. (5Sp) **Bahler, Hammond**
- 118. Vertebrate Embryology.** An introduction to the principles of development of the vertebrates. Prerequisite: Zoology 16 or equivalent. Three lectures, two labs. (5Sp) **Stanley**
- 119. Comparative Anatomy.** Fundamentals of structure of the main types of vertebrates are studied comparatively. Prerequisite: Zoology 16 or equivalent. Three lectures, two labs. (5W) **Dixon**
- 121. Ornithology.** Structure, classification, distribution and annual cycles of birds, with emphasis on study of the local fauna in the field. Prerequisite: Zoology 16 or equivalent. Two lectures, two labs. (4Sp) **Dixon**
- 122. Mammalogy.** Structure, classification, life histories and distribution of mammals; introduction to methods of field investigation. Prerequisite: Zoology 16 or equivalent. Two lectures, two labs. (4F) **Dixon**
- 123. Field Zoology.** Study of the most common Utah animals, including identification, natural history, distribution, ecology, etc. Also methods of study in the field, and collection and preparation of specimens for study, display and storage are considered. Some laboratory time is spent in making observations and collections in the field. Prerequisite: Zoology 16 or equivalent. Two lectures, two labs. (4F) **Linford**
- 127. Cytology.** Study of cells, both plant and animal, including techniques of study and sub-cellular organization. Prerequisite: Organic Chemistry. Three lectures, two labs. (5F) **Sanders, Stanley**
- 128. Elements of Histology.** Study of tissues, including characteristics of different kinds of tissues and the main organs. Prerequisite: Zoology 16 or equivalent. Four lectures, one lab. (5F) **Bahler**
- 129. Histological Technique.** Techniques employed in making preparations of animal tissues for microscopic study. Three labs. (3Sp) **Staff**
- 132. Mechanics of Evolution.** Critical study of the facts and theories pertaining to the biological principles of evolution, with emphasis on how it occurs including some consideration of population genetics. Prerequisites: Zoology 112 and Zoology 16 or Botany 26 or equivalents. Three lectures. (5Sp) **Bowman**
- 150. Herpetology.** Classification, distribution, life habits, and identification of amphibians and reptiles, with emphasis on the local forms. Prerequisite: Zoology 16 or equivalent. Two lectures, two labs. (4F) **Gunnell**
- 155. Ichthyology.** Ecology, classification, and life histories of native and introduced fishes. Three lectures, two labs. (5W) **Sigler**
- 201. Special Problems.** Individual study of a problem under the guidance of a staff member. Credit arranged. (F, W, Sp) **Staff**
- 205. Orientation for Graduate Students.** Introduction to procedures in graduate study; qualifying examinations, scientific method, selection of problem, becoming acquainted with literature, organization and writing of thesis and final examination. Required of all graduate students in Zoology, Entomology, Physiology. (1F) **Staff**
- 207. Theoretical Biology.** A critical study of modern biological thought. (3W) **Sanders**
- \*211. Genetics of Lower Organisms.** Concepts of genetic structure, function, and recombination in lower organisms with emphasis on current literature. Prerequisite: Zoology 112. Three lectures. (3Sp) **Simmons**
- \*\*212. Biochemical Genetics.** Concepts of genetic function at the chemical and molecular level, with emphasis on current literature. Prerequisites: Zoology 112, Chemistry 123; recommended, Chemistry 190. Three lectures. (3Sp) **Simmons**
- \*214. Current Topics in Genetics.** Intensive study of heredity and variation with emphasis on current research. Prerequisite: Zoology 112. May be repeated for credit with consent of the instructor. (3W) **Bowman**
- \*\*215. Genetics of Drosophila and Maize.** Concepts of genetic structure, function, and recombination in higher organisms, with emphasis on current literature. Prerequisite: Zoology 112. Three lectures. (3W) **Bowman**
- 224. Biological Electron Microscopy.** Theory and practice of techniques for the preparation of biological materials for study with the electron microscope. One lecture, two labs. (3F) **Stanley**

\*Taught 1968-69

\*\*Taught 1969-70



**225. Advanced Topics in Morphogenesis.** A consideration of selected problems in morphogenesis and other aspects of developmental biology. Prerequisite: Zoology 118. Three lectures. (3W) **Stanley**

**233. Zoogeography.** Principles governing the distribution of animals, with emphasis on terrestrial vertebrates, and the history of the biota of western North America from the beginning of the Cenozoic era. (3W) **Dixon**

**235. Protozoology.** The protozoa, with emphasis on parasitic forms, and on the methods of studying the protozoa. Consideration is also given to free-living protozoa and to classification, morphology, physiology, and reproduction of the protozoa in general. Two lectures, two labs. (4W) **Hammond**

**236. Advanced Parasitology.** Detailed study of certain parasitic protozoa and helminths, with emphasis on current research. Prerequisite: Zoology 116. (2Sp) **Hammond**

**240. Research and Thesis.** Research connected with problem undertaken for partial fulfillment of requirement for Master of Science or PhD degree. Credit arranged. (F, W, Sp) **Staff**

**261, 262. Seminar in Vertebrate Zoology.** Required of all graduate students in Vertebrate Zoology each Fall and Winter Quarter while in residence. Seniors and others interested may participate with the permission of the instructor. (1W, 1Sp) **Dixon**

**271, 272, 273. Seminar in Genetics.** Required of all graduate students in Genetics each Fall, Winter and Spring Quarter while in residence. Seniors and others interested may participate with the permission of the instructor. (1F, 1W, 1Sp) **Bowman, Gardner, Simmons**

**281, 282, 283. Seminar in Parasitology.** Required of all graduate students in Parasitology each Fall, Winter and Spring Quarter while in residence. Seniors and others interested may participate with permission of instructor. (1F, 1W, 1Sp) **Hammond**

**291, 292, 293. Seminar in Developmental Biology.** Required of all graduate students in Developmental Biology each Fall, Winter, and Spring Quarter while in residence. Seniors and others interested may participate with permission of instructor. (1F, 1W, 1Sp) **Stanley**

## Entomology

**Bachelor of Science Degree.** For a major in Entomology, the following courses are required: Biology 15; Zoology 16, 107, 112, 132; Entomology 13, 100, 101, 102, 111, 112, either 108 or 115; Botany 102, 130 (Botany 140 or Zoology 116 may be substituted with permis-

sion); Chemistry 20, 21, 22, 121, 122 and 123 (10, 11, 12 allowed in some specialties); Physiology 4; Mathematics 35; Wildlife Resources 160. In order to be certified for graduation, the candidate must have a 2.2 average in the above courses. The following are recommended: Entomology 21, 120, 230; Plant Science 119; Applied Statistics 131, 132; English 111, Plant Science 131; Physics 6. Students planning graduate work are advised to study a foreign language.

## Entomology Courses

**13. General Entomology.** Fundamental knowledge about insects—where they live, what they do, how they develop and behave; also structure, function, relationship to the environment and principles of insect control are considered. Students learn how to collect and preserve insects and to identify the major groups of these. This course is intended to serve as a foundation for other courses in Entomology and provide an introduction to the subject for those preparing to teach biology and for students in Agriculture and Wildlife Resources. (5Sp) **Staff**

**100. Systematic Entomology.** Classification of insects. Insect collection required. Prerequisite: Entomology 13. One lecture, one lab and field collecting. (3F) **Hanson**

**101. Principles of Animal Taxonomy.** A study of the principles of classification of animals and the rules of zoological nomenclature. Prerequisite: Entomology 100 or Zoology 16, or equivalent. Two lectures. (2W) **Hanson**

**102. Advanced Systematic Entomology Laboratory.** Advanced study of the classification of insects, including practice in the preparation of keys, description of species and scientific illustration. Prerequisite: Entomology 100. This course must be taken concurrently with Entomology 101. One lab. (1W) **Hanson**

**\*\*105. Forest Entomology.** Ecology, life history, identification and economic importance of major forest insect species. Beneficial and harmful insects, and general problems of forest insect control are discussed. Two lectures, one lab. (4F) **Davis**

**108. Agricultural Entomology.** Insect pests of major economic importance to agriculture, including their recognition, type of damage done, distribution, life history, and methods of control. Three lectures, two labs. (5F) **Davis**



**111. Insect Morphology.** Structure of insects, including external and internal anatomy. Prerequisite: Entomology 13. Three lectures, two labs. (5F) **Staff**

**112. Insect Physiology.** Function of the organ systems of insects. Prerequisite: Entomology 111. Three lectures, two labs. (5W) **Brindley**

**115. Medical and Veterinary Entomology.** A study of Arthropods that annoy and transmit agents of disease to man and domesticated and wild animals. Vectors of plague, spotted fever, tularemia, malaria and other Arthropods carrying disease receive major attention. Prerequisite: Zoology 16 or equivalent. Two lectures, two labs. (4W) **Hanson**

**\*120. Insect Pollination in Relation to Agriculture.** Pollinating insects in agriculture, including beekeeping as related to crop pollination, utilization of native pollinating insects, and special problems in the pollination of many commercial crops. (2W) **Bohart**

**\*\*130. Nematology.** Recognition, distribution, host and environmental relations, and control of nematodes with emphasis on plant parasitic forms. Prerequisite: Zoology 16 or equivalent. (3W) **Staff**

**138. Aquatic Entomology.** Identification, distribution, life histories and adaptations of aquatic insects, with particular reference to local streams and lakes. Two lectures, one lab. (3Sp) **Hanson**

**206. Insect Ecology.** Ecological principles as applied to insects, including fundamental concepts of ecology, ecological relationships, and measurement of ecological factors of importance in Entomology. The impact of changes in environmental conditions on insect populations also are considered. Prerequisites: Zoology 16 or equivalent, Entomology 13, and Wildlife Resources 160. (3W) **Hsiao**

**210. Special Problems.** Individual study under staff guidance. Prerequisites: Entomology 13, 100, 108. Credit arranged. (F, W, Sp) **Staff**

**\*\*212. Advanced Insect Physiology.** A detailed study of the biochemical and biophysical aspects of the organ systems of insects. Prerequisites: Entomology 112 and Chemistry 180 or equivalent. (3Sp) **Brindley**

**\*213. Insect Toxicology.** An introduction to the principles of toxicology as applied to the control of insects, including molecular structure of insecticides as related to toxicity, mode of action of insecticides, resistance of insects to insecticides, and problems of residues. Prerequisites: Entomology 112 or Physiology 151, and Organic Chemistry or Biochemistry, or equivalents. Three lectures, two labs. (5Sp) **Brindley**

**\*\*231. Biological Control of Insect Pests.** Study of invertebrate parasites and predators of insects. Consideration is also given to diseases of insects, vertebrate predators, and destruction of undesirable plants by insects. Prerequisite: Entomology 13 or 108. Three lectures. (3W) **Davis**

**250. Research and Thesis.** For research connected with problem undertaken for partial fulfillment of requirements for Master of Science or PhD degree. Credit arranged. (F, W, Sp) **Staff**

**261, 262, 263. Seminar in Entomology.** Required of all graduate students in Entomology each Fall, Winter and Spring Quarter while in residence. Seniors in Entomology and others interested may participate with the permission of the instructor. (1F, 1W, 1Sp) **Staff**

## Physiology

A major in Physiology must satisfy the Zoology requirements, and in addition complete Mathematics 110.

## Physiology Courses

**4. Human Physiology.** A survey of physiology which deals with the functioning of the human body, with emphasis upon broad general biological principles. Five lectures, one lab. (5F, W, Sp) **Bahler**

**20. Human Anatomy.** Structure of the main human body systems with emphasis on the muscular, skeletal and nervous systems. For students desiring a more thorough study of human anatomy than is given in Physiology 4. Prerequisite: Physiology 4. Two lectures, one lab. (3F, 3W) **Linford**

**104. Advanced Human Physiology.** A survey of the systems of man with emphasis on the functions of the circulatory, nervous and muscular systems. Designed primarily for students with teaching majors in the Biological Sciences. Prerequisites: Physiology 4, Zoology 16 or equivalent, Chemistry 12. Three lectures, two labs. (5Sp) **Staff**

**121, 122. Mammalian Physiology.** An intensive and detailed two-quarter course in physiology in which the functions of each of the organ systems of man and animals is studied. Students may not register for 122 without having had 121. As preparation, Zoology 16 or equivalent, Chemistry 20, 21, 22, 121, 122, 123 or equivalent and a course in Physics are required. Three lectures, two labs. (5F, 5W) **Ellis**

\*Taught 1968-69

\*\*Taught 1969-70

**130. Cellular Physiology.** A study of physiological functions at the cellular level. Prerequisites: Chemistry 121 and 122, and Physics 17, 18 and 19 or equivalent. Three lectures, two labs. (5W) **Sanders**

**141. Endocrinology.** A study of the ductless glands and their secretions. Emphasis is placed on the action of these hormones on growth, metabolism, and adaptation of animals to changes in their internal and external environments. Prerequisites: Zoology 16 or equivalent, Physiology 4, and Chemistry 121, 122. Three lectures, one lab. (4Sp) **Ellis**

**142. Physiology of Reproduction.** A study of the physiology of reproduction in mammals. Prerequisites: Zoology 16 or equivalent, Physiology 4 or Veterinary Science 20, and a course in Organic Chemistry; Physiology 141 is recommended. Two lectures, one lab. (3W) **Foote**

**151. Comparative Physiology.** A comparative study of organ function in the animal kingdom. Prerequisite: Physiology 121, 122 or 130. Three lectures, two labs. (5Sp) **Sanders**

**\*\*261. Physiology of Response.** A detailed physiological study of neuro-muscular mechanisms of response in the animal kingdom. Prerequisites: Physiology 122 or 130, Chemistry 190, Physics 19 or equivalents. Two lectures, one lab. (3F) **Sanders**

**271, 272, 273. Readings in Physiology.** Reading and reporting of classical and current literature in Physiology. Required of all Physiology graduate students each quarter while in residence. Seniors in Physiology and others may enroll with the permission of the instructor. (1F, 1W, 1Sp) **Staff**

**281, 282, 283. Seminar in Physiology.** Required of all Physiology graduate students each Fall, Winter and Spring Quarter while in residence. Seniors in Physiology and others may enroll with the permission of the instructor. (1F, 1W, 1Sp) **Staff**

**291. Research and Thesis.** Research connected with problem undertaken for partial fulfillment of requirements for Master of Science or PhD degree. Credit arranged. (F, W, Sp) **Staff**

## Pre-Dentistry

Students planning to enter dentistry may take the necessary courses in the College of Science to satisfy requirements for admission to any school of dentistry in the United States.

## Suggested pre-dental schedule:

### FRESHMAN YEAR

	Credits			
	F	W	Sp	
Chem 20, 21, 22 .....	5	5	5	
Math 34, 35, 44 or 46 .....	3	5	3 or 5	
English 1, 2, 3 .....	3	3	3	
MS, AS <sup>1</sup> , or PE .....	1	1	1	
Electives (optional) .....	3	2	5	
Total .....	15	16	17 or 19	

### SOPHOMORE YEAR

	Credits			
	F	W	Sp	
Biology 15, Zoology 16 .....	5	5		
Physics 17, 18 19 .....	5	5	5	
Electives (Optional) .....	7	7	12	
Total .....	17	17	17	

### JUNIOR YEAR<sup>2</sup>

	Credits			
	F	W	Sp	
Chem 121, 122, 123 .....	4	4	3	
Zoology 118 or 119 .....		5	or 5	
Electives .....	13	8	9	
Total .....	17	17	17	

Recommended electives are Psychology, History, Political Science, Sociology, Economics, Scientific Vocabulary, and other English courses.

Students planning to receive a BS degree in a combined curriculum (three years at USU and one year in a dental school) must complete a minimum of 141 credits of pre-professional work, including the USU graduation requirements.

## Pre-Medicine

The College of Science offers the courses to provide a pre-medical training that satisfies entrance requirements of medical schools in the United States and Canada.

**\*\*Taught 1969-70**

<sup>1</sup>Military Science or Aerospace Studies would be two credits each quarter.

<sup>2</sup>Students with unusually good records are sometimes accepted after two years of pre-dental work. In this case the required courses included in the three-year program listed above must be completed in two years.

**Suggested pre-medical schedule:****FRESHMAN YEAR**

	Credits		
	F	W	Sp
English 1, 2, 3 .....	3	3	3
Biology 15, Zoology 16, Physi- ology 4 .....	5	5	5
Math 35, 46 or 96, 97 .....	5	5	5
AS, MS, or PE .....	1	1	1
Electives .....	3	3	3
<b>Total</b> .....	<b>17</b>	<b>17</b>	<b>17</b>

**SOPHOMORE YEAR**

	Credits		
	F	W	Sp
Chem 20, 21, 22 .....	5	5	5
Physics 17, 18, 19 .....	5	5	5
Electives .....	8	8	8
<b>Total</b> .....	<b>18</b>	<b>18</b>	<b>18</b>

**JUNIOR YEAR**

	Credits		
	F	W	Sp
Chem 121, 122, 123 .....	4	4	3
Chem 115 .....	4		
Zoology 112 .....		5	
Zoology 118 .....			5
Electives .....	10	9	10
<b>Total</b> .....	<b>18</b>	<b>18</b>	<b>18</b>

**SENIOR YEAR**

	Credits		
	F	W	Sp
Zoology 127 or 128 .....	5		
Zoology 132 .....			5
Zoology 107 .....	4		
Any one of the following courses: Zoology 116, 212, Physl 130, Ent 115. ....		5	
Electives .....	6	10	10
<b>Total</b> .....	<b>15</b>	<b>15</b>	<b>15</b>

Electives should be chosen from the Humanities, Arts and Social Sciences. Some medical schools require or recommend Comparative Anatomy.

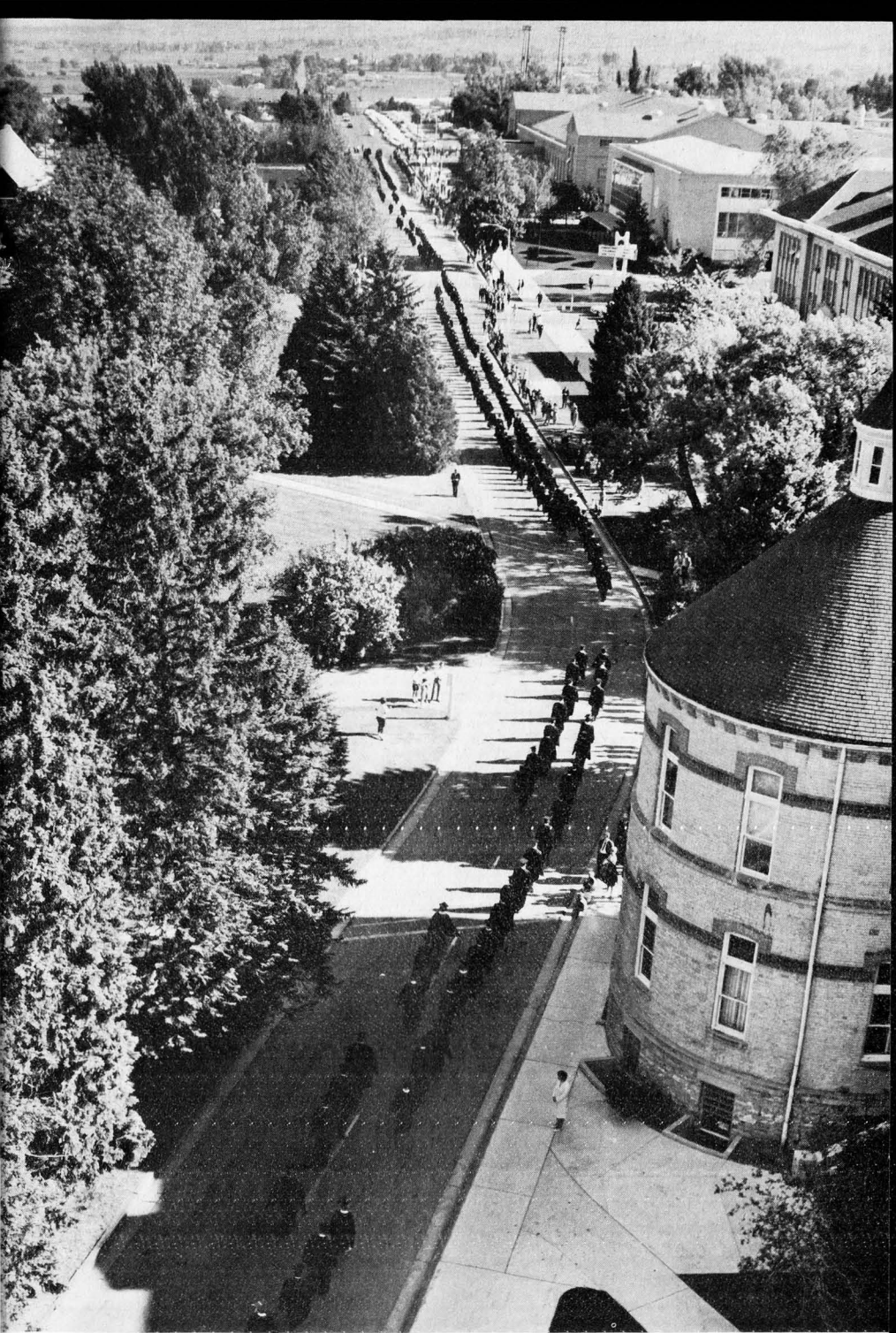
Students interested in graduation from USU before attending medical school may major in any subject.

If interested in a pre-osteopathic program, students should consult the pre-medical adviser.

If planning to receive a BS degree in a combined curriculum (three years at USU and one year in a medical school), students must fulfill requirements of USU and must complete a minimum of 141 credits of pre-professional work.

**Nursing**

If students have Registered Nurse credentials, they may pursue studies toward a Bachelor of Science degree in Nursing. Credits earned toward the RN are applied toward the BS, as evaluated by the Registrar. A student may be graduated with a major in Nursing or may complete studies for a degree in a field such as Public Health or Bacteriology.



*SCHOOL OF GRADUATE STUDIES*

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School of

## Graduate Studies

Eldon J. Gardner, **Dean**  
Office in M 132

Graduate study is supervised by the Dean of the School of Graduate Studies. Policy is determined by the Graduate Council. This Council consists of one representative from each of the eight resident colleges of the University. The librarian is an ex-officio member. Members of the Council are nominated by the Faculty Senate and appointed by the President to serve four-year terms, two to be appointed each year.

**The present Graduate Council** is listed below with the year in which each member's term of office expires: College of Agriculture, Joseph C. Street, 1969; College of Business and Social Sciences, Thelrel L. Black, 1971; College of Education, Homer M. Johnson, 1968; College of Engineering, Bruce O. Watkins, 1968; College of Natural Resources, John N. Neuhold, 1969; College of Family Life, Jay D. Schvanveldt, 1971; College of Humanities and Arts, Jay R. Jensen, 1970; College of Science, Keith L. Dixon, 1970.

Graduate degrees offered at Utah State University include: Civil Engineer, Irrigation Engineer, Master of Education, Master of Forestry, Master of Music, Master of Science, Master of Business Administration, Master of Industrial Education, Master of Arts, Master of Fine Arts, Master of Landscape Architecture, Doctor of Education and Doctor of Philosophy.

A graduate with a Bachelor's degree from USU or from any other accredited college or university may be admitted to the School of Grad-

uate Studies if: 1) he is recommended by a department for an advanced degree program and 2) he meets the scholastic requirements of the School of Graduate Studies. A "B" average in the most recent two years of academic work is necessary for admission to the School of Graduate Studies. Seniors at USU who have an average of "B" or better in their courses in the Junior and Senior years, and who at the beginning of any quarter lack not more than six credits to complete all requirements for the Bachelor's degree, may be allowed to register in the School of Graduate Studies at the same time they are completing their undergraduate requirements. A form for a split program may be obtained from the School of Graduate Studies.

**An application for admission** accompanied by transcripts of all previously earned college credits, and by three letters of recommendation, should be presented to the School of Graduate Studies, preferably at least 60 days in advance of the day of registration. The student's file will be submitted to the department in which he proposes to work, for approval. Applications should be accompanied by an application-evaluation fee of \$10. This nonrefundable fee is paid by all graduate students making application to matriculate at USU for the 1968 Summer Quarter and ensuing quarters.

If the student cannot qualify for an advanced degree program in a particular field, he may be admitted to the University as a nonmatriculated Graduate Student. When he

meets the requirements of his department to enter an advanced degree program and the scholastic requirements of the Graduate School he may be admitted to the School of Graduate Studies.

### General Policies on

## Graduate Work

**Qualifying Examinations.** A qualifying examination is required by the School of Graduate Studies and may be taken prior to registration. If not taken then, this examination and any other qualifying examination required by the major department must be taken as soon as possible after registration. The results of these examinations become a part of the student's file in the Graduate Office. If found to be deficient in the work basic to the field in which he proposes to study, he may be required to take undergraduate courses—which do not count in the minimum requirements for the advanced degree—to satisfy the deficiency.

**Supervisory Committee.** When it has been determined that a student is acceptable as a possible candidate for a higher degree, the major professor will suggest a committee to assist in guiding his program and in conducting necessary additional qualifying examinations and the final examination. When the program has been determined and approved by the committee, he will be advanced to candidacy for a degree. Advancement to candidacy must be accomplished before the end of the Winter Quarter if one plans to graduate at the following commencement. When research is best supervised by a federal collaborator, or other person who is not a member of the regular teaching staff, such collaborator or other person may be designated as thesis

director. This thesis director is a member of the student's committee.

**Thesis or Dissertation.** A candidate for an advanced degree usually must present a thesis or dissertation on a topic within the field of his major subject, which must represent from nine to fifteen hours of the credit presented for the Master's degree, and as much as forty-five hours of credit for the Doctor's degree. The thesis must be a contribution to the field of knowledge, based upon the student's own research or a treatment and presentation of known subject matter from a new point of view. When approved by the major professor or thesis director, a copy must be submitted to each member of the advisory and examining committee at least two weeks before the date of final examination. When the thesis is approved by the committee and the candidate has successfully passed the final examination, four copies of the final draft of the thesis must be deposited in the Graduate Office. Two of these copies will be deposited in the library, another sent to the Department, and the fourth returned to the student.

**Microfilming of Thesis.** A Doctoral candidate pays a fee of \$20 to have his dissertation microfilmed. This film is produced by and registered with University Microfilms, Ann Arbor, Michigan, which also publishes an abstract.

**Thesis Alternate.** The supervisory committee may permit the substitution of one or two advanced reports, valued at three to ten credits, for the regular Master's thesis. These are known as "Plan B" reports. The Master's program is otherwise the same under "Plan B." In certain specialized programs, no thesis or "Plan B" papers are required.

If a student is working under "Plan B" in General Agriculture,

the Dean of the College of Agriculture will select a major professor to be the chairman of the student's supervisory committee. This program must include a minimum of six credits each in the fields of Plant Science, Animal Science, and Agricultural Economics.

**Credit Load.** Recommended maximum load for full-time graduate students is sixteen credits. Maximum for assistants engaged in teaching or research is twelve credits, except that students assisting in research which results in their thesis or dissertation may register for the full load, if such registration includes at least four credits of research or thesis.

**Final Examination.** A candidate for the Master's degree is required to pass a comprehensive final examination on the subjects of graduate study and on his thesis, if one is part of his program. This examination may be oral or written or both as the committee decides, and is open to all faculty members and officials of the School of Graduate Studies.

Arrangements for the time and place of the examination are made by the Dean of the School of Graduate Studies. A member of the advisory and examining committee, other than the major professor, or other representative of the Graduate Council, is appointed to act as chairman of the examination and submits to the Graduate Office the results of the examination. If a student is to receive his degree at the June Commencement, the date of the final examination should not be later than April 15.

**Time Limit.** Work for a graduate degree must be completed within six years from the date of matriculation as a regular student in the School of Graduate Studies. Older work may be revalidated by examination. Statements signed by the

student's committee and department head specifying action taken on particular outdated courses must be submitted to the Graduate Office for approval before such courses can be used to fulfill the requirements for a degree.

**Extension Course Credit.** The amount of extension class or other off-campus credit to be allowed will be determined in consideration of the entire course program. The total of all off-campus credit may not exceed eighteen hours, exclusive of thesis. All extension courses for which graduate credit is sought must be regularly registered for through the School of Graduate Studies, and must have the sanction of the head of the department in which graduate work is being done. Credit toward a Master's degree is not granted for home study (correspondence) courses.

**Transfer Credit.** A maximum of nine quarter credits of graduate work satisfactorily completed at another approved Graduate School may be allowed toward a Master's degree. The extent to which such credit may reduce either the course or the residence requirements will be determined by the committee.

## Degrees of

### Master of Arts, Science

The Master of Arts and the Master of Science degrees are offered in most of the basic biological, physical, and social sciences and in various educational, industrial, and professional divisions of the University. Specific departments in which the Master's degree is given, together with the courses provided by the departments, may be determined by consulting the departmental statements in this catalog.

**Requirements.** The program for the Master's degree must include:

1) At least 27 residence credits exclusive of thesis; 9 credits taken at off-campus residence centers may count toward this requirement; 2) At least 45 credits in courses approved by the department or Advisory committee for graduate credit; 3) At least 10 credits, exclusive of thesis, in courses numbered 200 or above; 4) A thesis with 9 to 15 credits, or thesis alternate; 5) For the Master of Arts degree, two years of a foreign language, or equivalent proficiency in such a language as proved by testing.

### Degree of

#### Master of Education

**Degree Areas.** A course of study leading to the Master of Education degree is offered in the following areas: Elementary School Teaching, Elementary School Administration, Elementary School Supervision, Secondary School Teaching, Secondary School Administration, Secondary School Supervision, and Special Education.

The course of study leading to the Master of Education degree in each of the above areas has for its purpose the preparation of thoroughly prepared teachers, supervisors, and administrators. It provides a broad foundation in the field of education and in the particular area of specialization, and differs from the Master of Science degree by providing more flexible requirements to meet specific needs. This degree emphasizes a proficiency in the interpretation and application of research.

The requirements for the Master of Education degree include: 1) At least 48 credits beyond the Bachelor's degree, subject to the same limitations of off-campus course credit, transfer credit and time limit as the Master of Science

degree; 2) General culture courses in the Humanities, Sciences, and Social Sciences; 3) Specified courses in each of seven areas of the field of education; 4) Possession of a teaching, administrative, supervisory or other appropriate state school certificate; 5) Evidence of potential success as a teacher or successful teaching experience.

### Degree of

#### Master of Business Administration

The Master of Business Administration degree is given upon completion of a course of study prescribed by the Department of Business Administration within the general requirements of the School of Graduate Studies. It is designed to serve the needs of graduates from recognized colleges of Business as well as graduates in Liberal Arts, Science, Engineering or other fields with a professional interest in management. The entire program, aimed at developing broad executive skills, can be covered in a period of two years. Those with strong backgrounds in Business Administration and Economics, however, should be able to complete the program in a significantly shorter time.

### Degree of

#### Master of Fine Arts

This is a specialized professional degree. In 1959 the College Art Association of America approved the MFA, rather than the PhD, as the terminal degree in the Studio Arts. Whereas an exceptional student devoting full time might qualify after four quarters, it is generally considered to require an average of two years to produce enough art works of sufficient



quality to be recommended for this degree. The accumulation of credits and the number of quarters in residence are not major factors in granting the MFA degree. The emphasis is clearly on the productive demonstration of high artistic and technical achievement by students with considerable creative abilities. Only students whose previous art works indicate a promising potential in Art will be accepted for admission to the MFA program.

Because this degree is highly individualized, the student should consult the department or his graduate committee for more detailed information on requirements.

### Degree of

#### Master of Forestry

The Master of Forestry degree is given upon completion of a course of study prescribed by the Department of Forest Science within the general requirements of the School of Graduate Studies. It is designed for those who have a Bachelor's degree in some field other than Forestry and who wish to earn a degree in Forestry. It normally requires from two to three years, depending upon how closely the original field is related to Forestry.

### Degree of

#### Master of Industrial Education

The Master of Industrial Education degree provides advanced preparation for those engaged in teaching, supervising, or administering industrial education programs. This program is sufficiently flexible to meet the needs of individuals engaged in the various phases of the work. It is planned

to provide the cultural and professional development considered essential to educational leadership in this field. The requirements are essentially the same as for the Master of Science degree except that additional professional course work is taken in lieu of the traditional Master's thesis requirement. The candidate must complete a scholarly piece of work designated as a *Master's Paper*. This report should demonstrate the student's competence in professional writing. The degree is awarded only when the candidate's overall record, including course work, the Master's examinations and the Master's Paper, represent creditable accomplishment. Candidates for this degree should have had successful industrial, supervisory, administrative, or teaching experience.

### Degree of

#### Master of Landscape Architecture

Requirements for this degree include:

1) The MLA Degree is the professional terminal degree in Landscape Architecture and Environmental Planning as established by the American Society of Landscape Architects. It constitutes a one-and-a-half to two-year program including 60 credits in the two hundred series courses.

2) Holders of Bachelor's degrees in allied fields, may become candidates for the MLA if they satisfactorily complete, or have completed, 45 credits in Landscape Architecture at the upper division level.

3) A thesis of 10 to 15 credits is required, the precise number of credits determined jointly by the candidate and faculty, depending upon the complexity and scope of the chosen subject.



4) The level at which students enter into the graduate program will be determined by an evaluation of their past background and experience.

5) Certain upper division and graduate courses will be required in allied fields, particularly if the candidate chooses to take a Master of Science in Environmental Planning, which encompasses a broader approach to design problems, rather than the M.L.A.

### Degree of

#### Master of Music

The Master of Music degree offers advanced specialized training both in musical performance and in the teaching of music. It is attained through completion of a course of study which is planned to increase the candidate's understanding of the art of performance and the art of successful music teaching. Candidates for this degree must show evidence of being either unusually gifted performers or competent teacher-performers of music. Students may elect a recital or a thesis project. If the thesis project is elected in lieu of the recital it must deal with some aspect of music teaching and make a significant contribution to the improvement of the creative teaching process. The student may select a course of study leading to a major in Music Education or a major in Applied Music.

Each candidate must successfully complete an examination for admission to the program of graduate study in Music. This examination may be taken under the supervision of a proctor at a college or school designated by the University Department of Music and near the candidate's place of residence.

### Degrees of

#### Civil Engineer and Irrigation Engineer

The College of Engineering offers a two-year graduate program in Civil Engineering and in Irrigation Engineering, leading to the degrees of Civil Engineer and Irrigation Engineer. The plan of study for these degrees is similar in many respects to plans at other western institutions for degrees of Civil Engineer, Mechanical Engineer, etc.

**Requirements.** The program for these degrees includes: 1) A minimum of six quarters of study, of which at least three quarters must be in residence at Utah State University; 2) Completion of 90 credits of approved courses; 3) Completion of a minimum of 30 credits of graduate courses (200 series), exclusive of thesis; 4) Completion of an adequate thesis based on a research program for which a maximum of 30 credits may be allowed by the committee.

For candidates who present the Master of Science degree in an appropriate field of Engineering, and who have completed a thesis project for this degree, the requirements will be modified as follows: 1) A minimum of three quarters in residence; 2) Completion of a suitable program of study of not less than 45 credits, of which at least 30 credits must be graduate courses (200 series), and may include a maximum of 20 credits for thesis.

The suggested curriculum for these degrees is detailed in the section on College of Engineering.

### Specialist in

#### Educational Administration (Six-Year Program)

A new six-year program in the

College of Education terminates in the Specialist in Educational Administration or Specialist in Education. Requirements include: 1) A Master's degree or equivalent; 2) A total of 45 credits—27 on the Logan campus, of which 15 credits must be taken in one quarter; 3) At least 12 credits in Secondary Education for candidates with previous preparation in Elementary Education and a minimum of 12 credits in Elementary Education for those previously prepared in Secondary Education; 4) Written comprehensive examination covering the work taken; 5) qualifications for either Utah State Department of Public Instruction General Administration Certificate or equivalent approved certificate.

### Degree of

#### Doctor of Education

The degree of Doctor of Education is designed especially to prepare for leadership and expert service in the field of Education. Requirements for this degree include the development of competence in an area of specialization in Education plus a thorough development of skills and knowledge of the broad field of Education and in a field supplementary to professional education.

The minimum requirements for the Doctor of Education degree are: 1) A Master's degree or equivalent; 2) A program of at least 90 credits of approved graduate study beyond the Master's degree; 3) An acceptable dissertation for which a maximum of 18 credits may be given; 4) Four quarters of residence at Utah State University, three of which must be in consecutive sequence (minimum 12 credits per quarter).

Detailed requirements for the above degrees may be obtained at

the office of either the Dean of the School of Graduate Studies or the Dean of the College of Education or the Head of the Department in which the degree is to be taken.

### Degree of

#### Doctor of Philosophy

The degree of Doctor of Philosophy (PhD) is awarded by Utah State University in recognition of high attainment and productive scholarship in a specific field of learning.

**Majors Offered.** The Doctor of Philosophy degree is offered in: Agricultural and Irrigation Engineering, Animal Science, Bacteriology, Botany, Chemistry, Civil Engineering, Clothing and Textiles, Ecology, Economics, Electrical Engineering, Food and Nutrition, Food Science and Technology, Forest Science, Mechanical Engineering, Nutrition and Biochemistry, Physics, Plant Science, Psychology, Range Science, Sociology, Soils and Meteorology, Toxicology, Wildlife Resources, Zoology.

Admission to School of Graduate Studies to work toward the degree of Doctor of Philosophy is obtained in the same manner as for the Master's degree. Qualifying examinations are similarly required, and the program is likewise directed by a supervisory committee.

**Requirements.** The program for the Doctor of Philosophy degree must include: 1) Three years of full-time graduate study above the Bachelor's degree. If the student has a Master's degree, then two years will be required. The student's supervisory committee may recommend that part of this program be taken at other schools, but the last year must be spent in residence at Utah State University; 2) A minimum of 135 credits of approved graduate study beyond

the Bachelor's degree; 3) A major field to which approximately two-thirds of the time is devoted and a minor. The minor may be divided between two suitably related areas. A Master's degree in a suitably related area may satisfy the minor requirement; 4) A research problem on which a dissertation will be presented. Credits for this dissertation will generally not exceed 45, and work on the dissertation should ordinarily occupy most of the third year, but may be carried on with course work throughout the program.

**Language Requirement.** A reading knowledge of at least one modern language other than English is required in the PhD program. Normally one of the languages of global scientific or scholarly communication—French, German, Russian, Spanish—will be selected according to the candidate's particular need. The requirement of a second modern foreign language is optional with the department in which the major is taken.

Testing and certification of language proficiency will be performed by the faculty of the Department of Languages on the basis of courses completed and/or performance in language proficiency exams offered to eligible applicants semi-annually (in November and April). The required language proficiency should be demonstrated before the beginning of the third year of graduate work.

**Comprehensive Examination and Candidacy.** Written and oral examinations are conducted by the supervisory committee and the department concerned, usually in the last quarter of the second year of work, to determine fitness for admission to candidacy for the degree of Doctor of Philosophy.

**Dissertation.** A completed dis-

sertation approved by the major professor must be presented to the supervisory committee at least eight weeks before the student would graduate. The dissertation must show ability to do critical and independent research. It must present a contribution to knowledge in scholarly fashion.

**Final Examination.** The final examination in defense of dissertation will be conducted by the supervisory committee at least six weeks before the student is to graduate.

### Teaching and Research Assistantships

A number of teaching and research assistantships in various departments of the University are available each year to graduate students. Teaching assistantships carry a stipend of \$1,100 to \$2,800 for one-third to one-half teaching service on a nine-month basis. Remuneration for research assistantships may vary from \$1,100 to \$3,300 depending upon the time of service involved. Generally assistantships are arranged so that the student may complete the Master's degree in two years.

At present, assistantships are available in the following areas: Animal Science, Art, Business Administration, Agricultural Economics, Bacteriology and Public Health, Botany, Chemistry, Family and Child Development, Civil Engineering, Dairy Science, Economics, Education, English, Entomology, Forest Science, Food and Nutrition, Geology, History, Irrigation and Drainage, Industrial and Technical Education, Music, Mathematics, Languages, Physiology, Physics, Physical Education, Plant Science, Psychology, Range Science, Soils and Meteorology, Sociology, Speech, Vegetable Crops, Veterinary Science, Wildlife Resources, and Zoology.

## Fellowships

**University Research Fellowships** carry a stipend of \$2,000 and the remission of nonresident tuition. The student is required to participate successfully in a research project leading to a Master's thesis or Doctor's dissertation. These are tenable in any field in which USU grants an advanced degree. Application must be made by February 1, and awards are made April 1.

**Traineeships.** The University has traineeship programs supported by National Institutes of Health, National Science Foundation, and the National Aeronautics and Space Administration. The basic stipend is \$600 per quarter, with tuition and fees paid, and with additional for dependents and progression. Most of the major departments participate in these programs.

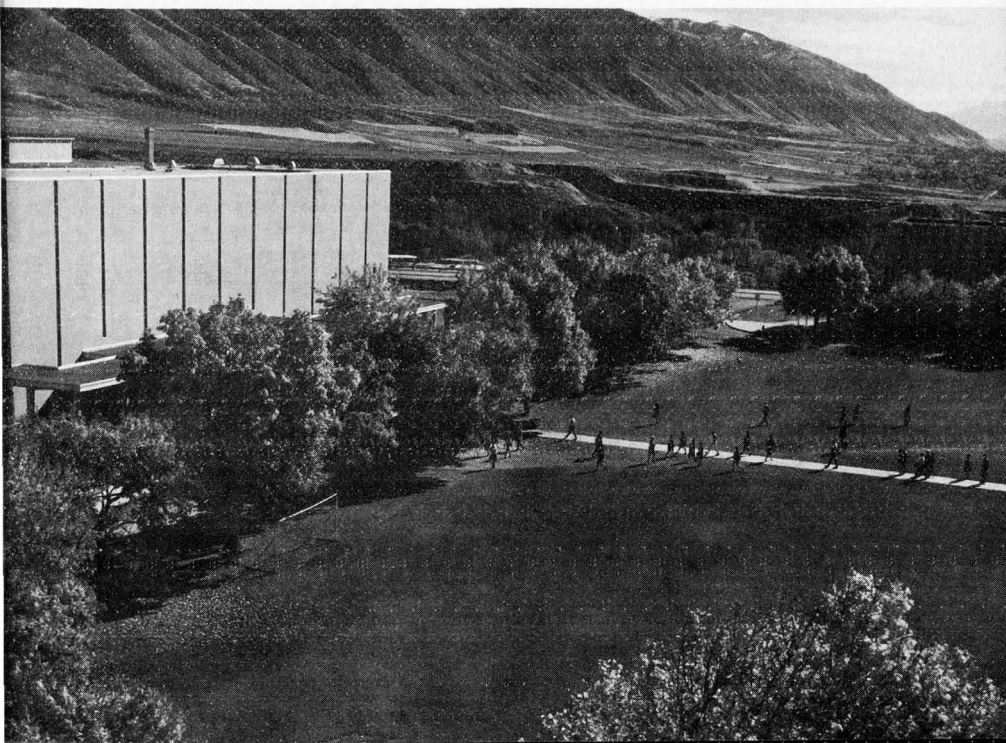
**NDEA Fellowships.** These fellowships are available at Utah State in Botany, Chemistry, Civil Engineering, Education, Electrical Engineering, Physics, Range Sci-

ence, Soils and Meteorology, Wildlife Resources, and Zoology. They are for students who wish to become college and university teachers, and who will undertake a doctoral program. Basic stipend is \$600 per quarter with additional for dependents and progression and with tuition and fees paid.

**Other Fellowships.** The University also participates in the Graduate Fellowship Program of the National Science Foundation, and in the Fellowship Program of the National Institutes of Health.

## Tuition Scholarships

A number of tuition scholarships are available to beginning graduate students who are residents of Utah. Also, there are a limited number of waivers of out-of-state tuition in recognition of excellent scholarship. Applications should be made to the Dean, School of Graduate Studies. (Also, see catalog section on Scholarships.)





*Interdepartmental Curriculum in*

# Ecology

The Utah State University Center of Ecology was created on July 15, 1966, by the President and Board of Trustees of Utah State University. The objectives of the Center are designed to coordinate research and teaching programs in ecology on the Utah State University campus.

Historically ecology developed in several areas on the Utah State University campus. Some form of plant ecology training or research developed in the Departments of Range Science, Botany, and Forest Science. Animal ecology developed in the Departments of Wildlife Resources and Zoology. Courses in environmental influences developed in the Departments of Geology and Soils and Meteorology.

The creation of the Center of Ecology allowed the development of an interdepartmental curriculum in ecology pooling the resources of the seven departments. It is now possible to earn graduate degrees in plant ecology in the Departments of Range Science, Botany and Forest Science and animal ecology in the Departments of Wildlife Resources and Zoology. The development of a degree in paleoecology in the Department of Geology is being considered for the near future.

A competence in ecology requires background in a large number of disciplines. Although ecologists usually have had their primary training in biology, they must also have some understanding of geology, soils, meteorology, chemistry, physics and statistics. To provide this background, the following courses should be completed in the undergraduate program or early in graduate study: college algebra,

trigonometry (and if possible calculus), two quarters of applied statistics, general chemistry and organic chemistry, physics (one year), general botany, general zoology, plant taxonomy, genetics, plant ecology and animal ecology.

Applicants for the MS degree in Plant Ecology are also required to show credit for Soil Survey and Classification (Soils 114) and Plant Physiology (Bot 120), plus a minimum of five courses from those listed below, including two from group A.

Applicants for the PhD in Plant Ecology must meet the requirements for the MS and show credit for an additional three courses from the list below, including one course each from groups A and B.

Applicants for the MS in Animal Ecology are required to show credit for an upper division course in animal physiology and five courses from the list below, including two from group B.

Applicants for the PhD in Animal Ecology must show credit for three additional courses beyond the MS including one each from A and B.

A research thesis is required for all degrees.

For a description of specific courses refer to the department headings.

## Group A *Plant Ecology*\*

RS 210 Plant Autecology  
 RS 211 Plant Synecology  
 RS 215 Plant Geography  
 RS 221 Ecophysiology  
 Bot 121 Plant Water Relations  
 Bot 200 Evolutionary Ecology  
 FS 204 Forest Ecology  
 RS 212 Vegetation Analysis

\*Tentative list



**Group B Animal Ecology\*\***

WLR 148 Animal Behavior  
 WLR 260 Animal Population Ecology  
 WLR 262 Fish Population Theory  
 Zool 106 Insect Ecology  
 Zool 233 Zoogeography  
 Zool 260 Environmental Vertebrate Physiology

**Group C Supporting Courses\***

Bot 224 Plant Growth and Development  
 Bot 228 Photosynthesis  
 Chem 180 or 190 Biochemistry  
 FS 220 Forest Autecology  
 FS 221 Forest Synecology

FS 222 Forest Ecosystem Analysis  
 Geo 115 Surficial Geology  
 Geo 212 Paleocology and Biostratigraphy  
 Met 125 Bioclimatology  
 Soils 155 Chemical Edaphology  
 Soils 165 Physical Edaphology  
 WLR 161 Limnology  
 WLR 166 Aquatic Ecology  
 WLR 248 Analysis of Animal Behaviour  
 Zool 113 Insect Physiology  
 Zool 123 Endocrinology  
 Zool 132 Mechanics of Evolution  
 Zool 151 Comparative Physiology

\*Tentative List

**Interdepartmental Curriculum in****Economics**

This interdepartmental program is provided by combining the resources of the Departments of Economics and Agricultural Economics. The Colleges of Engineering and Natural Resources provide additional support. The research program is supported by the Agricultural Experiment Station, the Economics Research Institute, the Utah Water Research Laboratory, and the Computer Center as well.

Strong areas of course study and thesis research are available in economic theory, agricultural economics, quantitative economics, economic history, public finance and monetary and fiscal analyses.

**Doctor of Philosophy Degree Requirements.** The student must meet the requirements for admission to candidacy and pass the Final Thesis Examination.

**Requirements for Admission to Candidacy.** A student shall be admitted to candidacy upon completion of the following four requirements:

1) Successful performance in the preliminary examinations as follows:

a) Successful performance on a written core examination covering basic price theory and basic income and employment theory; b) Successful performance on a written preliminary examination in the area of quantitative economics; c) Successful performance on any two written preliminary examinations, at least one of which must be chosen from a list of fields of concentration as offered by the Program not including the field of quantitative economics. One field may be chosen outside the areas covered by the Interdepartmental Program.

2) Complete the following distribution requirements:

Demonstration of competence in at least five fields as offered in the Program in addition to the fields covered in the preliminary examination. Competence may be shown by graduate credit with a grade of "C" or better in a course of at least 3 quarter credits.

3) Demonstrate reading knowledge of one foreign language.

4) Prepare a thesis prospectus and obtain approval of the same at a seminar composed of the Interdepartmental Faculty.

After being admitted to candidacy, the student will prepare a thesis and will be examined on the thesis by the entire Interdepartmental Faculty.

For a listing of course offerings

see Agricultural Economics under College of Agriculture and Economics under College of Business.

The chairman of the Interdepartmental PhD Program in Economics is Dr. B. Delworth Gardner.

### Interdepartmental Curriculum in

## Food Science and Technology

A graduate program in Food Science and Technology leading to Master of Science or Doctor of Philosophy degree is available to outstanding students. Facilities of the several departments conducting research in Food Science and Technology have been made available in this curriculum to afford students maximum opportunity to gain experience and training. Included in the facilities are an Animal Metabolism Building, Meats Research Laboratory, and equipment for conducting digestion and metabolism studies on large and small animals; several research laboratories are equipped with instruments such as the electron microscope, spectrograph, ultracentrifuge, electrophoresis, gas chromatography, refrigeration, processing pilot plants, respiratory meters, and standard laboratory equipment.

Prerequisites for a major toward an advanced degree should include Chemistry (qualitative, quantitative, organic, and elementary biochemistry), Mathematics (college algebra, geometry, and a year of calculus for PhD candidate), and

in addition, appropriate courses in Botany, Plant Pathology, Zoology, Physiology, Bacteriology, Public Health, English Composition, Agriculture and Foods.

#### Master of Science Degree Requirements

Course	Credits
Science and Technology courses (related to research and specialization) .....	10
Advanced Biochemistry and/or Organic Chemistry 190 and above .....	6
Applied Statistics 131 and above .....	12
Physical Chemistry 101 .....	4
Quantitative Chemistry 115 .....	5
Food Microbiology 120, 121 .....	4
Research and Thesis (maximum) .....	15

#### Doctor of Philosophy Degree Requirements (Beyond MS degree requirements)

Science and Technology (related to research and specialization) .....	8
Advanced Biochemistry and/or Organic Chemistry 190 and above .....	12
Applied Statistics 131 and above .....	12
Physical Chemistry 104 and above .....	3 to 9
Biophysics 140, 141 and/or Radiobiology 143 .....	3 to 9
Intermediate Quantitative Chemistry 152 and Instrumental Analysis 153 .....	7
Food Microbiology 120, 121 or others .....	4
Research and Thesis (maximum) .....	45

Chairmanship for the curriculum rotates biennially; D. K. Salunkhe is chairman for 1968-69.

Interdepartmental Curriculum in

## Nutrition and Biochemistry

Facilities of the several departments conducting nutrition and biochemical research have been made available in this curriculum to afford students maximum opportunity to gain experience and training in the biochemistry of human and animal nutrition.

Major problems currently being studied are effects of toxic and non-toxic substances on digestion and metabolism of farm animals, atmospheric pollution, cholesterol metabolism, amino acid metabolism, and other basic physiological processes related to nutrition.

Training in the curriculum is designed as preparation for research in educational institutions, governmental and industrial laboratories, and for college teaching.

Prerequisites for a major in the curriculum include basic training in English, Chemistry, Mathematics, Physics, Bacteriology, Botany, Physiology, and Zoology. For specific requirements for the MS or Ph D degree, write the curriculum chairman. Any deficient prerequisite work must be completed without graduate credit.

**Master's Degree Requirements**

Course	Credits
1. Advanced Nutrition .....	10
2. Advanced Biochemistry .....	10

3. Statistics .....	8
4. Electives and Research .....	17-21
Total .....	45-49

**Doctorate Degree Requirements**

Course	Credits
1. Advanced Nutrition .....	18
2. Advanced Biochemistry .....	20
3. Statistics .....	12
4. Physical Chemistry .....	9
5. Physiology, Zoology, Pathology .....	20
6. Electives and Research .....	67
Total .....	146

A student shall spend at least two-thirds of his time for the doctorate degree, including thesis, on the major subject. The minor must be in an area of work which can be logically related to that of the department in which the student is doing his major work.

Appropriate minors are Mathematics, Statistics, Chemistry, Physics, Physiology, Genetics and other fields closely related to the major.

For more specific details concerning admissions, requirements, and available scholarships and fellowships write the curriculum chairman.

Chairmanship for the curriculum rotates each two years; chairman for 1967-69 is Dr. Ethelwyn B. Wilcox.

Interdepartmental Curriculum in

# Plant Nutrition and Biochemistry

Facilities of the various departments conducting research in Plant Nutrition and Biochemistry have been made available for this program. This includes plant growth chambers, laboratories equipped with equipment such as an electron microscope, ultracentrifuge, refrigerated centrifuges, spectrophotometers for ultra violet, infrared visible, fluorescence and recording studies, chromatography equipment, Warburg apparatus, scaling and counting meters, electrophoresis apparatus and general laboratory equipment.

Prerequisites for a major in this curriculum include Botany (general and plant physiology), Chemistry (qualitative, quantitative, and organic), Mathematics (including one year of geometry and calculus) and Physics. Any deficiency must be completed before an individual is accepted as a candidate for a graduate degree.

Master's Degree Requirements	
Course	Credits
Botany	
1 course (102, 116, 117, 118, 125, 130, 150, 212, 230) .....	3-5
1 course (121, 221, 222, 224, 225, 226, 227, 228) .....	3-4

Chemistry	
2 courses (190, 191, 192) <sup>1</sup> .....	6
1 course (101) <sup>2</sup> .....	4
Seminar .....	2
Zoology	
Genetics 112 .....	5
Mathematics 99 .....	5
Graduate Seminar (3 quarters) .....	3
Research .....	9-15

## Doctorate Degree Requirements (after BS program)

Course	Credits
Botany	
1 course (102, 116, 117, 118, 125, 130, 150, 212, 230) .....	3-5
3 courses (121, 221, 222, 224, 225, 226, 227, 228) .....	9-12
Chemistry	
Physical Chemistry 104, 105, 106 .....	9
Advanced Biochemistry (190, 191, 192, 295) .....	14
Zoology	
Genetics 112 .....	5
1 course (Zoology 212, Physiology 130, Chemistry 287 or Chemistry 113) .....	3-5
Seminar .....	3
Research .....	Maximum 45

Chairmanship for the curriculum rotates; R. L. Smith is chairman for 1967-69.

<sup>1</sup>Students not allowed to count both Chemistry 180 and 190 for credit.

<sup>2</sup>Students are encouraged to follow the PhD curriculum if they are anticipating receiving a PhD at this University. The reason for this is the difference in the Physical Chemistry requirement.

*Interdepartmental Curriculum in*

# Toxicology

The toxicology curriculum allows for the study of the deleterious effects of chemicals (plant, animal, insect, or man-made toxins) at the system, organ, tissue, or cell levels. It encompasses both biological and physical disciplines. This interdepartmental approach provides unique opportunities for advanced training in the broad field of toxicology with emphasis in a chosen discipline.

Graduates in toxicology are prepared as research scientists in educational institutions, governmental and industrial laboratories, and for university teaching.

Extensive investigations of the effect of fluorine compounds on plants and animals, of the effect and mechanism of action of pesticides on animals and of teratologic effects of poisonous plants have been made at this institution in recent years. Recent investigations have been on animal venoms, noxious air and water pollutants, carcinogens, allergens and toxins of plant and bacterial origin. These toxicoses are studied in wild animals, game birds and fishes as well as in farm and laboratory animals.

Facilities for handling and hous-

ing all types of animals are available, either aquatic or terrestrial, wild or domestic. Modern laboratories are equipped to perform technical procedures in chemical and physical analyses, physiologic interpretations, ultracentrifugation, fluorescent tracing, radioactive isotopes, photography, tissue culture, histopathology and food technology.

Applicants for training in the curriculum may be students with MD and DVM degrees or with BS or MS degrees in Nutrition, Animal Science, Food Technology, Biological Sciences or Physical Sciences.

Courses which will be required of candidates will depend upon their previous training and area of interest. Students trained primarily in biological sciences may need to strengthen their knowledge of basic physical sciences and vice versa. Students without medical degrees may need to strengthen their knowledge of pathology, physiopathology, and pharmacology.

The Toxicology curriculum is at present partially supported by an NIH Training Grant.

Chairmanship of the curriculum rotates on a three-year basis. Current chairman is Merthyr L. Miner.







*SUMMER QUARTER*

# Summer Quarter

Ellvert H. Himes, **Director**

Office in Main 130

Dates: June 17 - August 23, 1968

First Session — June 17-July 19

Second Session — July 22-August 23

The Summer Quarter at Utah State University is more than just the fourth quarter of the University's program of academic and cultural offerings. It is unique in that special programs are devised for early admission to the University, continuing undergraduate education, and significant professional advancement in specialized fields of endeavor.

The Summer Quarter is divided into two sessions of five weeks each. It also provides for numerous short workshops, seminars, clinics, and institutes. Conferences are held for which credit is offered. High school graduates are encouraged to begin their college career in the Summer Quarter. Those high school students of superior ability may find it most opportune to inaugurate their college program after completing their Junior year. The credit earned may be retained while completing high school graduation. A full quarter's work enables continuing students to complete professional preparation early and thus get into the world of work a year ahead of time. The graduate student may complete requirements for a Master's degree in three summers; the doctoral candidate will find rich selection to supplement a high-level program.

Numerous challenges and cultur-

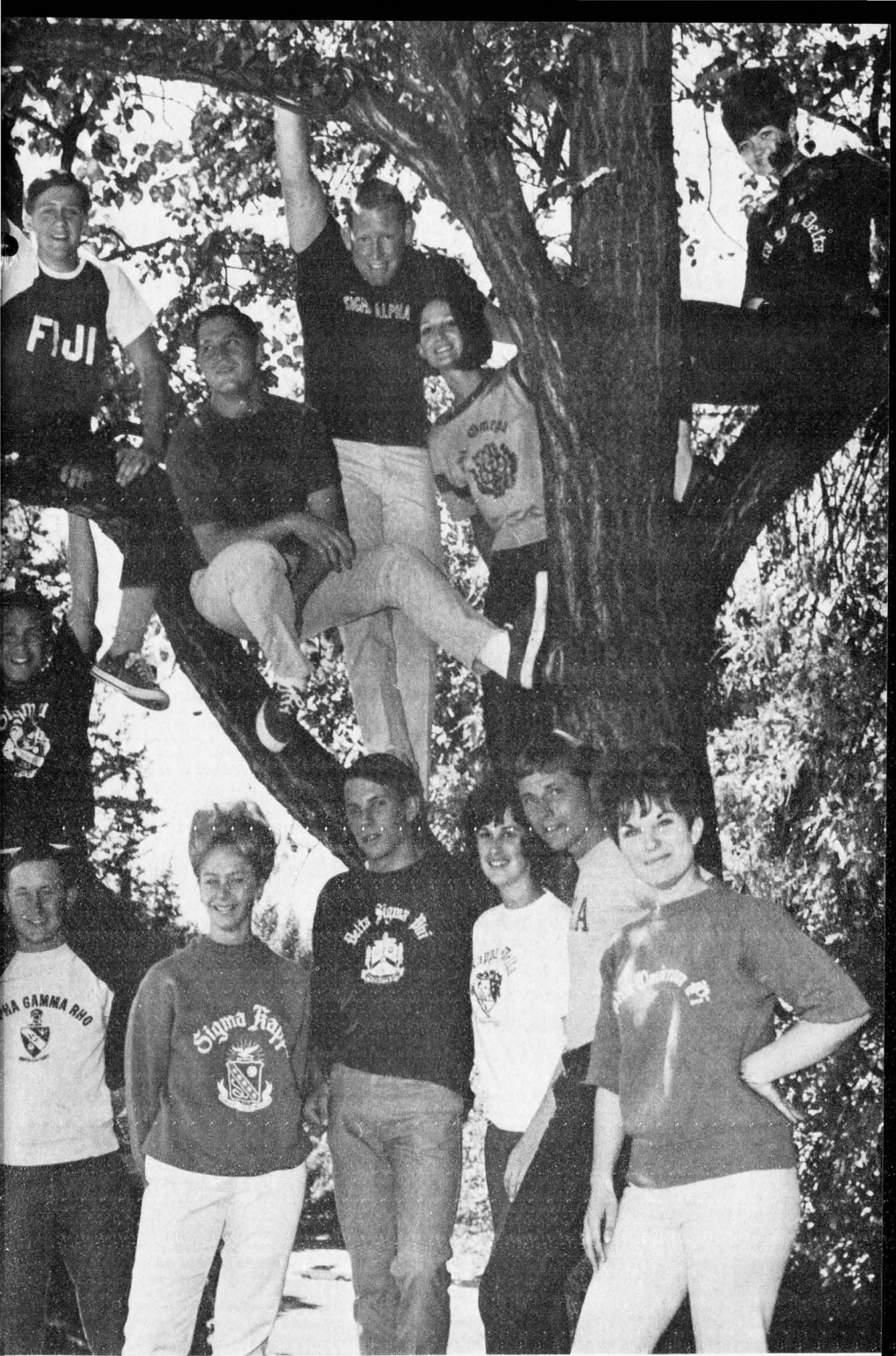
al advantages are offered during the Summer Quarter. Recitals, concerts, dramas, and special lectures encourage individuals of all ages in creative work and development of individual talents.

The highly qualified resident faculty of Utah State University is augmented in the summer by distinguished visiting professors of national and international reputation.

A distinguishing feature of the Summer Quarter is the carefully planned and carried out program of recreational enrichment. The Coordinator of Student Activities supplies all students opportunities in their various interest fields for out-of-class activities on a regular, yet informally scheduled basis. University-wide programs are planned that provide activities both on the campus and in the coolness and convenience of the nearby canyons. Contests and tournaments are conducted both on the campus and in the Utah State Union. The Union supplies numerous outlets for recreation and relaxation.

The location of Utah State University, with its climate and scenic canyons, nearby national parks and monuments, provides special inducements for comfortable and enjoyable study for collegiate education at all levels.





## *STUDENT SERVICES AND ACTIVITIES*

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# Student Services and Activities

**Dean of Students** Claude J. Burtenshaw; **Dean of Women** Helen Lundstrom; **Assistant Dean of Students and Chairman of Scholarships, Awards and Honors** John R. Williams; **Coordinator of Student Activities and Director of Student Union** Val R. Christensen; **Coordinator of Student Housing** William W. Skidmore; **Assistant Coordinators of Student Housing** Stella Israelsen and Lee G. Osborne; **Coordinator of Counseling and Testing** Ronald S. Peterson; **Assistant Coordinator of Counseling and Testing** Keith T. Checketts; **Coordinator of Student Health Services** Willis Hayward; **Student Employment Placement Supervisor** Blair Hale; **Foreign Student Adviser** LaMar Frandsen; **Coordinator of High School Relations and Student Programming** Richard Thorderson; **Student Loans Officer** Reese T. Murray; **Assistant Coordinator of Student Activities and Assistant Director of the Union** Louis D. Griffin; **Student Program Coordinator** Richard B. Watkins.

Office in Main 102

The function of Student Services is to assist students to adjust to the University. It is so organized and coordinated with the academic offerings as to become an integral part of the broad educational program of the institution. Features of the program include: high school cooperation; orientation activities; personalized advisement and counseling services; recreational and social activities; health services; supervised campus and off-campus living arrangements; financial aids in the form of scholarships, awards, grants-in-aid and loans; employment placement for parttime and graduate needs; special assistance to students from outside the United States; opportunities for meeting religious needs and development.

The administration and coordination of the entire program of student services is the responsibility of the Dean of Students. Each of the various services is under the direction of specialists and qualified faculty members who have been carefully selected to consider each student in reference to his or her particular needs.

Inquiry from prospective students and those on campus who wish to obtain information and assistance

with personal needs or out-of-class activities should be directed to the Office of Student Services, Main 102.

## Religion

The traditional philosophy of separating Church from State does not mean that the University may not have an interest in religion. A university education, USU officials believe, should permit opportunities for religious participation and exploration.

Catholic, Protestant and LDS Churches offer religious courses for USU students in their near-campus educational facilities. Credit earned in non-sectarian University approved courses may be transferred at the request of the student to his University transcript. Credit courses are considered as part of the student's academic quarter load at the University. Academic quarter load limits may be exceeded only with the academic dean's approval.

The churches also provide religious services, personal counseling and social activities. USU officials are interested in the spiritual and moral understanding of students and encourage them to participate in the church of their choice.

## Housing

Residents must be regularly enrolled students at Utah State University. (Costs subject to revision.)

Students living in dormitories are required to pay a hall activity fee of \$2 per quarter in addition to rent.

### Supervised Living Accommodations for Single Women

All Freshman women not living at home must live in campus housing. In rare instances, special permission may be granted by the Dean of Women to live off campus. A request should be written by the parent or guardian at least one month before the opening of school.

**Apartment-Living Residence Halls** will accommodate six to eight women in an apartment. Accommodations consist of combination living room-kitchen, bath, and three bedrooms. Living room-kitchen is equipped with electric refrigerator, electric range, table, chairs, and draperies. Housekeeping items are furnished by tenants. Cost of telephone and electricity is shared by the occupants. Rent is \$82 to \$92 per quarter.

### Sorority and Fraternity Houses

Sorority and Fraternity houses provide board and room for their members and are managed by their own officers. Each has a University-approved housemother in a supervisory capacity. Rates are determined by the house manager and compare favorably with other living rates on campus.

### High Rise Dormitories

The newest residence hall complex on the campus consists of two seven-story high rise buildings and a Food Service Center. One building will accommodate 392 single women; the other, 392 single men.

These are *board and room accommodations* providing 20 meals per week. Linen changes, bedding, study desks, lamps and utilities are furnished. Towels and other personal effects are not furnished. Each building has 24 single occupancy rooms. The balance of the rooms accommodate two students each. Fine features of this new housing complex include elevators, TV room, study lounges, and typing and music practice rooms.

*Rates are \$252 per quarter for double occupancy; \$272 per quarter for private single room. There are no accommodations without board.*

### Supervised Living Accommodations for Single Men

**Richards Hall**, a conventional board and room residence hall, will accommodate 360 men. A dwelling unit provides for eight men, two to a bedroom. Twenty meals per week are provided in the Food Service Center. Linen changes, bedding, study desks, lamps, and utilities are furnished. Towels and other personal effects are not furnished. A cost of \$242 per person per quarter covers board and room charges. Cost of room without board is \$107 per quarter.

**Bullen Hall**, an apartment type residence hall, accommodates 144 men. An apartment consists of a living room-kitchen combination, a bathroom, and three large bedrooms. The living room-kitchen combination is equipped with an electric refrigerator, built-in electric range, table, chairs and draperies. Housekeeping items are furnished by the tenants. Cost of electricity and telephone expenses are shared by the six men in the apartment. Cost for one quarter is \$82 per person.

**Van Noy Apartments.** Six blocks north of Old Main on the corner of

8th East and 12th North is located the University's single men's housing area known as Van Noy Apartments. Each apartment accommodates six men. These apartments are housekeeping type units, three bedrooms, fully carpeted (except in the eating area) with study area. A coin-operated launderette serves the area.

The rent rate is \$92 per person with all utilities furnished except electricity and telephone. The electricity and telephone bills will be shared by the tenants.

### **Living Accommodations for Married Students**

*Two-bedroom apartments* for married students are located at 10th North and 12th East. Monthly rental charge is \$65 unfurnished, \$70 furnished. The tenant pays for electricity and heat in addition. Each apartment includes electric refrigerator and range, and drapery on the living room window. All other furnishings must be provided by the tenant. No television antennas will be permitted on the roof.

**University Trailer Court**, located on the corner of 12th East and 11th North, provides modern trailer connections to sewer and water mains. Students are encouraged to bring private trailers. These must be modern, sanitary trailers. Parking space is hard surfaced. A utility house provides laundry space and rest rooms. The University provides coin-metered washing machines and dryers. No provision is made for use of private-owned laundry equipment. Monthly space rental per trailer home is \$22. Tenants are required to comply with safety regulations.

### **LDS Student Living Center**

The David O. McKay Student Living Center is composed of seven apartment buildings—four for wo-

men and three for men. They are designed as family living units with six students in an apartment, and are located on 10th North and 12th East. Charges are comparable to University housing. The units house 288 women and 216 men. There is ample parking and city bus service on the half hour. Address all inquiries and applications to Housing Manager, David O. McKay Student Living Center, 10th North and 12th East, Logan, Utah.

### **Off-Campus Housing**

The Housing Office checks off-campus housing and establishes an approved list for students. Many apartments, rooms, board and room, and batching quarters are available in the community. In each instance the final arrangements must be made with the landlord. Rates are determined by the accommodations offered. Most board and room situations consist of 12 to 14 meals per week. The noon meal is rarely provided by the landlord. A noon meal can be purchased in the Student Union Cafeteria on campus for about 65c. This arrangement costs an off-campus student about \$75 per month. Sleeping rooms range from \$20 to \$30 per month for a single room, and \$45 to \$90 per month for apartments.

Students desiring off-campus housing may procure the current housing list upon arrival at the University, Room 103, Main Building.

### **Application for Housing**

Prospective students are invited to direct inquiries and requests for application to Coordinator of Student Housing, Main Building 105, Utah State University, Logan, Utah. Upon request, an application form will be furnished. This application should then be completed and returned with the \$25 application fee. Housing assignments are

made on a receipt of application priority basis.

An accepted housing application qualifies a student for housing accommodations only. Application for University admission should be made to the Office of Admissions and Records, Main 110.

### Housing Regulations

Students living in private housing are obligated to retain their accommodations for at least one quarter. Rents are payable in advance. A two-week prior notice of intent to vacate should be made with the householder whenever a student intends to vacate a living accommodation. *Students living in University-owned residence halls agree by written contract to retain their accommodations for the academic year.* Rents are payable in advance. Accounts become delinquent 10 days after scheduled payment. A penalty of \$1 late fee plus 10c per day thereafter is imposed. The \$25 fee is forfeited if 1) notice of withdrawal from University housing is made after August 1, in the case of Fall Quarter; December 1 for Winter Quarter; and March 1 for Spring Quarter, or 2) a student moves from the assigned hall prior to the end of the period covered by the agreement.

Dogs, cats and other similar pets are strictly forbidden within the University Housing area. Very few private home owners permit pets.

### Food Service

Food service is obtainable in the University Cafeteria located in the Student Union Building on campus. Monday through Friday schedules and approximate costs are: Breakfast 6:30-8:00 a.m., 50-65c; Lunch 11:00 a.m.-1:00 p.m., 65-85c; Dinner 4:30-6:00 p.m., 75c-\$1. Satur-

days and Sundays, Breakfast 8-9 a.m., Lunch 12-1:30 p.m., Dinner 4:30-6:00 p.m. Dinner is not served on Sundays. The snack bar operates 8 a.m.-10 p.m., Mondays through Saturdays, and is open Sunday evenings, 5 to 7 p.m.

### Awards, Honors, Scholarships and Grants-in-Aid

The University offers a variety of scholarships and awards. Some of these are actual money grants in varying amounts, others provide for registration and tuition fees to be waived. The latter kind generally come under the classification of tuition scholarships.

The primary purpose of the tuition scholarships is to assist new students who have high scholarship and financial need in becoming established in college. These scholarships are discussed in greater detail under the section of Scholarships and Grants-in-Aid for new students.

Most of the scholarships which consist of actual money grants are reserved for students who have been attending Utah State University for at least one year and preferably two years or more. These are usually given at the Awards and Honors Convocation which is held early in May of each year. Students who are interested in awards may obtain information from the Office of Student Services, Room 102, Main Building. Closing dates for receiving applications are announced well in advance of such dates.

### Scholarships and Grants-in-Aid

(Presented principally to students already enrolled)

#### All Colleges

**The Lieutenant Clyde Parker Baugh Memorial Fund.** A gift of Mr. and Mrs. Willford F. Baugh, it provides four scholarships annually for deserving students of high scholarship and leadership.



**Business & Professional Women's Scholarship.** A \$150 scholarship is awarded annually by the Logan Business & Professional Women's Club to a senior woman student who has maintained high scholarship, demonstrates need, shows qualities of citizenship and leadership, and who would contribute significantly to her chosen profession.

**The Johansen Scholarship Fund.** A gift of the late Mrs. Johana Johansen, it provides scholarships annually, worth in the aggregate from \$125 to \$150, for help of worthy students of Junior and Senior rank.

**Phi Kappa Phi Scholarship.** A \$100 cash award given to a Sophomore student and Junior student of high scholarship and outstanding character.

**Rhodes Scholarships.** Candidates for Rhodes Scholarships at Oxford University, England, are selected each year from Utah. High scholarship and some definite quality of distinction, whether in intellect, character, or personality, or in any combinations of these, are the most important requirements. Seniors or graduate students are generally chosen as candidates. It is suggested, however, that students would do well to be preparing for the candidacy in earlier years. Information and application blanks may be obtained from the University representative, Rhodes Scholarship Committee.

**The 1927 Class Gift to the College.** This yields an annual income sufficient to provide four scholarships of \$125 each. Application should be made by Juniors and must be accompanied by an approved outline of a proposed study project to be completed during the Senior year. Two copies of the complete thesis are to be filed in the University library.

## College of Agriculture

**4-H Scholarship offered by Alpha Gamma Rho.** The national fraternity of Alpha Gamma Rho offers annually a cash scholarship of \$200 to be applied toward a full-term course at any suitable accredited college of agriculture. The National 4-H Awards Committee has sole responsibility for selection of the winner from among the candidates nominated by the State 4-H Club Leaders, such selection to be on the basis of scholarship, achievement and demonstrated need. Further information may be secured from Alpha Gamma Rho Fraternity, 706 West Michigan Avenue, Urbana, Illinois.

**FFA Scholarship offered by Alpha Gamma Rho.** The national agricultural fraternity of Alpha Gamma Rho offers annually a cash scholarship of \$200 to be applied toward a full-term course at any suitable accredited college of agriculture. The American Vocational Association has sole responsibility for selection of the winner from among candidates nominated by the State Supervisors of Agricultural Education, such selection to be on the

basis of scholarship, achievement and demonstrated need. Further information may be secured from Alpha Gamma Rho Fraternity, 706 West Michigan Avenue, Urbana, Illinois.

**First Security Foundation.** Two scholarships of \$500 each, one awarded to a student of Business and Finance and the other to a student in Agriculture, both at the end of their Sophomore or Junior year from either the Sophomore or Junior class.

**Jenkins-Jones Memorial Scholarship.** An award of \$500 given to an outstanding upper division student in Agronomy. Available for school expenses the following year.

**Ralston Purina Scholarship.** A scholarship of \$500 given in recognition and assistance to an outstanding Junior in Agriculture for use in his schooling the Senior year.

**Sears-Roebuck Foundation Scholarships for Freshmen.** Ten scholarships of \$300 each are given annually to outstanding high school graduates of Utah who enroll to major in Agriculture at Utah State University. Available for school expenses the Freshman year.

**Sears-Roebuck Foundation Scholarship for a Sophomore.** A scholarship of \$300 to a Sophomore student in Agriculture who, among the recipients of the Sears-Roebuck Awards for Freshmen, had the highest grade point average the Freshman year. Available for school expenses the Sophomore year.

## College of Business and Social Sciences

**O. Guy Cardon and M. N. Neuberger Scholarship in Social Science.** The Bluebird Candy Company at Logan offers a scholarship in the social sciences: Economics, History, Political Science, and Sociology, in honor of the late O. Guy Cardon and of M. N. Neuberger. Applicants majoring in the fields indicated should contact the Dean of Business and Social Sciences.

**Harry E. and Vera F. Carleson Scholarship in Economics.** Two \$200 scholarships given to outstanding Junior or Senior students majoring in Economics.

**First Security Foundation.** Two scholarships of \$500 each, one awarded to a student of Business and Finance and the other to a student in Agriculture, both at the end of their Sophomore or Junior year from either the Sophomore or Junior class.

**A Cache Valley Cooperative Scholarship.** This scholarship of \$7,000 bears interest at 6 percent, earning \$420 annually. This scholarship is limited to graduate students in the Departments of Sociology, Agricultural Economics and Science. A thesis on some phase of cooperation is involved. For information inquire from the department head involved.

**Joseph A. and Grace W. Geddes Scholarship.** Limited to graduate students in Sociology.



## 372 *Student Services and Activities*

Present value \$7,000, comprised of \$2,000 contributed by the Utah Cooperative Association and smaller amounts from students and friends. Annual stipend \$200. The Sociology staff supervises the funds by adding to its earnings and donations, aiding students to select projects useful to society, and supervising studies.

**Social Work Scholarships.** Earnings from an endowment fund established in 1937 provides 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.

### College of Engineering

**Utah Power & Light Research Fellowship in Irrigation Engineering** to support a graduate student. Grant totals \$4,000. Of this, \$2400 is given directly to the student and \$1600 is given to the department in support of the student's research project.

**Manufacturing Engineers.** Two \$100 scholarships are awarded to Engineering students who show interest, ability and scholarship in pursuing Tool Engineering curriculum. Donors are Eimco, and McGhee-Hogan Machine Works, Salt Lake City. Application should be made to the Salt Lake City Chapter 85, or Manufacturing Engineering Department, USU, not later than February 10, each year.

**Associated General Contractors Scholarship.** A gift of the Intermountain Chapter, AGC, provides a scholarship grant of \$300 to a Junior Engineering student. The award is made on the basis of scholarship, promise as an engineer, and need. Selection is made by a committee representing the AGC and the Civil Engineering Department. Applications for the succeeding year must be filed with the Dean on or before April 1.

**Industrial Arts Club Scholarship.** The Industrial Arts Club of USU awards a scholarship of \$50 to an outstanding Sophomore or Junior student majoring in Industrial Arts. The recipient is designated in Fall quarter of each year. Applications are made to the Industrial Arts Club and are judged on scholarship, need, school and club activities.

**Eric W. Ryberg Scholarship.** A grant of \$200 from the Utah Sand and Gravel Company is made to a student in Civil Engineering selected by a special committee. Application should be made to the Dean of the College of Engineering by December 1.

**Socony Oil Company Scholarship.** A \$500 scholarship to a Mechanical Engineering student on the basis of scholarship, need, and ability as an engineer.

**Western Electronic Manufacturers Association Scholarship Awards.** Several WEMA scholarship awards are made each year to

Electrical Engineering students based on high scholarship and need. The amounts will be from \$150 and up depending on the annual WEMA grant to USU.

### College of Family Life

**Greaves Memorial Scholarships.** Two or more \$125 scholarships in memory of Drs. Joseph E. and Ethelyn O. Greaves for students who have achieved in the field of Family Life.

**Moen Memorial Scholarship.** Two \$125 scholarships in memory of Johanna Moen given to worthy students in the College of Family Life who show outstanding aptitude in the field.

**The Phi Upsilon Omicron Scholarship.** Two scholarships of \$75 are given annually by the Kappa Chapter of that Organization to Sophomore or Junior girls in the College of Family Life who are active members of the chapter.

**Sears Roebuck Foundation Scholarships for Freshmen.** Two \$300 scholarships given annually to outstanding high school graduates of Utah who plan to major in Family Life. Available for school expenses the Freshman year.

### College of Humanities and Arts

**Deseret News Professional Internship in Journalism.** The Deseret News offers the outstanding Junior student in Journalism a scholarship including one year's tuition at the University 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.

**Herald Journal Scholarship in Journalism.** The Logan Herald Journal annually presents a \$50 scholarship at the beginning of the Winter quarter to help some worthy Journalism student continue at the University.

**Esther V. Erickson Wrigley Scholarship.** The Robert L. Wrigley family presents two scholarships annually to English majors in memory of Mrs. Wrigley. One \$175 scholarship is given to an outstanding student of Sophomore standing and one \$225 scholarship is given to an outstanding student of Junior rank.

**English Department Scholarship.** The English Department awards annually one \$150 scholarship to an outstanding student who has completed his Freshman year at USU. He must be an English major.

**W. Mont Timmins Essay on the Pioneering of Cache Valley.** A \$50 prize is awarded annually 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. Details from USU English Department.

## College of Natural Resources

**The Paul M. and Neva Dunn Scholarship in Forestry.** See Dean's office for details.

**The Fraternal Order of Lumbermen, Club No. 70,** awards annually an indefinite number of scholarships for worthy Forestry students in the College of Natural Resources. The scholarships are awarded on the basis of scholarship and financial need. They are awarded to entering Freshmen, and are \$100 minimum. Applications should be made to the Dean of the College not later than October 1.

**The William G. Kohner scholarship fund** for Junior, Senior and graduate students in the College of Natural Resources. Income from the fund will be used annually for scholarships to deserving students.

**American Society of Range Management Scholarship.** One scholarship for the best Range senior in the State of Utah. The scholarship is in the amount of \$100, and application should be made to the Head of the Department of Range Management by June 1.

## College of Science

**Greaves Memorial Scholarships.** Two or more \$125 scholarships in memory of Drs. Joseph E. and Ethelyn O. Greaves for students who have achieved in the fields of Science and Family Life.

## Scholarships and Grants-in-Aid (Primarily for new students)

The University grants annually scholarships covering from one to three quarters' tuition each on the basis of outstanding academic ability or demonstrated ability in the areas of Speech, Drama, Music, Art, Athletics, Commercial Training, and other academic subjects. Tournament and contest winners frequently receive these awards.

High school students who have served in major and responsible positions of leadership in school may receive a leadership award.

To be eligible to apply for an academic award, a high school student must have a full B (3.0) average or better in all academic solid subjects at the end of the first semester of the Senior year of school.

To be eligible to apply for a leadership award, a high school student must have a C plus (2.5) average or better in all academic solid subjects at the end of the first semester of the Senior year of school.

The University also awards grants-in-aid to help deserving students who have economic need.

To be eligible for a grant-in-aid, a student must meet either of the following requirements:

1) A Freshman must have been academically rated as in the upper two-thirds of his high school graduating class. For the first year such award shall be made on an annual basis.

2) A student, other than a Freshman, must be in good academic standing and not on probation. Such award shall be made on a quarterly basis.

All of the above awards are under the jurisdiction of a Scholarship, Awards and Honors Committee, which alone has the authority to promise or grant an award. All applications for grants-in-aid or scholarships should be made to the chairman of this committee.

All scholarships and grants-in-aid must be applied toward the payment of tuition or fees.

Any scholarship or grant-in-aid may be withdrawn at any time for academic or other good and sufficient reasons, if, in the judgment of the Dean of Student Services, the recipient has clearly demonstrated his failure to comply with both the spirit and the letter of the original terms of the scholarship or grant-in-aid.

**Tuition Scholarship.** The President of the University is authorized by Title 53, Chapter 34, Section 1-a, Utah Code Annotated, 1953, to waive registration and tuition fees in full or in part for a limited number of meritorious or impecunious students whose domicile is in the state of Utah.

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**USU Faculty Women's League Annual Scholarship.** This provides \$125 for one year for a Freshman woman. Selection is based on need, scholarship, and leadership.

**Union Pacific Scholarships.** The Union Pacific Railroad awards 16 scholarships annually to Juniors or Seniors in high school who are enrolled as 4-H Club members, also 16 to FFA members. These members' scholarships are \$200 each and are to be used at Utah State University or its branches. The scholarships are available in the following counties: Beaver, Box Elder, Cache, Davis, Iron, Juab, Kane, Millard, Morgan, Rich, Salt Lake, Summit, Tooele, Utah, Wasatch, Washington, and Weber.

**Intercollegiate Knight Scholarship.** Two \$100 scholarships will be given based on a combination of scholastic and leadership ability. The recipients must be single, male, from out of state, and of the Freshman class. They will be asked to attend one of the regular IK meetings and tell the group about their future plans.

**Logan Kiwanis Club.** A \$100 scholarship is awarded each year. The award is made available to one college each year, in alphabetical sequence among the colleges. Each dean, in his turn, selects an outstanding student in his college to receive the award.

**Logan Kiwanis Club.** One \$100 scholarship awarded to an outstanding student who is in need of financial assistance. They also support the Circle K Club.

**Logan Lions Scholarship.** The Logan Lions club will award two \$100 scholarships to be given to students selected by the Logan Lions Scholarship Committee. Nominees for the scholarship will be selected by the Office of the Dean of Students. Emphasis will be given to need. Scholarships will be awarded to a Sophomore or older student for either Winter and/or Spring quarter.

**Logan Rotary Club.** Three \$100 scholarships awarded to outstanding students who are in need of financial assistance.

**National 4-H Club Contests.** National scholarships of \$300 each are available to 4-H Club members in at least 22 different projects or activities.

**Palmer Scholarships.** Val W. Palmer scholarship fund gives ten scholarships of \$100 each and are awarded each year to students of outstanding scholarship and leadership ability.

**Woodey B. Searle Scholarship.** A tuition scholarship is awarded each year by Woodey B. Searle to a needy and deserving graduate of the Uintah High School. Applications should be filed before April 15th with the principal of the UHS at Vernal.

**Sears-Roebuck Foundation Scholarship.** Thirteen scholarships of \$300 each are awarded

annually by the Sears-Roebuck Foundation to Freshmen in the College of Agriculture. Selection is made from graduating Seniors of the high schools of Utah on the basis of interest in agriculture, scholarship, leadership, and financial need. The winner who has the best scholastic record at the end of his Freshman year receives an additional scholarship for use in his Sophomore year.

**Sears-Roebuck Foundation Scholarship in Family Life.** Two scholarships of \$300 given to an incoming Freshman student in the College of Family Life who has a high scholastic standing, leadership ability, and promise of achievement.

**Standard Oil Scholarships.** The Standard Oil Company of California offers five scholarships to 4-H Club members in Utah and five scholarships to FFA members in the amount of \$300 each.

**Utah Dairy Federation.** The Utah Dairy Federation gives an annual scholarship of \$100 each to a 4-H boy and a 4-H girl who will enroll in Dairy or Home Economics at USU.

## Awards and Honors

**William Alger Awards.** A gold key is awarded annually by Alpha Epsilon Delta, pre-medical society, to the outstanding Freshman pre-medical or pre-dental student. Scholarship, character and possibilities in medicine or dentistry represent the basis for the award.

**Alpha Kappa Psi Scholarship Key Award.** Alpha Kappa Psi Fraternity, Alpha Theta Chapter, established at Utah State University, awards annually the Alpha Kappa Psi Scholarship Medallion to the male Senior in Business with the highest scholastic average for four years of study in this University.

**Alpha Kappa Psi Scholarship Key Award.** Alpha Kappa Psi Fraternity, Alpha Theta Chapter, established at Utah State University, awards annually the Alpha Kappa Psi Medallion to the male Senior student in Business who possesses the highest scholastic average for three years of work taken in this University.

**Alpha Lambda Delta Award to Senior Students.** Book Award: An award to a Senior woman who has been an Alpha Lambda Delta member and who carries the highest grade-point during her four years of college.

**Alpha Zeta Award.** An award is made annually by Alpha Zeta fraternity honor society of Agriculture and Forestry students, to the Sophomore in Agriculture or Forestry who made the highest scholastic record in his Freshman year. The name of the winner is engraved upon a permanent trophy.

**American Institute of Electrical Engineers.** Awarded annually to the member of the student chapter who has contributed most to the IRE organization, and who has demonstrated professional ability. This award consists of a certificate of merit and one year's dues as an associate member of AIEE.

**American Institute of Electrical Engineers Student Award.** This award is made each year to the outstanding Senior Electrical Engineering and AIEE member. The award consists of one year's dues as associate member of AIEE and a certificate of achievement.

**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.

**The American Rambouillet Sheep Breeders' Association Challenge Cup.** To be presented each year to the student showing the greatest efficiency in fitting and showing Rambouillet sheep.

**American Society of Agronomy Leadership Award.** A plaque to the outstanding Senior in Agronomy.

**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 basis of scholarship, activities, and personality. Selection is made by the Intermountain Section upon recommendation 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.

**The Barnes Key.** Rey and Marjorie Barnes award a key annually to an undergraduate student who is affiliated with the campus radio or television station. The student must have a cumulative grade point average of 2.5 or above, must have carried at least one radio class during the year of the award, and must have demonstrated a deep interest in furthering radio and television arts at Utah State University. Selection shall be made by the Director of Radio and Television at USU, the person directly responsible for the campus radio station, and Rey L. Barnes.

**Blue Key Award.** Each year Blue Key Honorary Service Fraternity awards a "Service Plaque" to an outstanding Freshman or Sophomore male student. Candidates are judged on University activities, scholarship, service to the University, and moral character. Application forms can be obtained from the organization and must be filed with the Blue Key Awards Committee on or before April 15.

**Burpee Award in Horticulture.** An annual award of \$100 to the student in Horticulture who rates highest in scholarship, practical experience and interest in flower, vegetable and seed growing.

**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.

**Chemical Rubber Publishing Company Freshman Chemistry Award.** The Chemical Rubber Publishing Company annually awards to an outstanding Freshman in General Chemistry, a copy of its Handbook of Chemistry and Physics.

**Chemistry Faculty Award.** The staff of the Chemistry Department annually awards a copy of the Handbook of Chemistry and Physics to the outstanding Freshman student completing Chemistry 10 and 11.

**Chi Omega Fraternity Award.** An award of \$25 is given annually to the girl 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 Fraternity each year from the teaching staffs of the Sociology and Economics Departments.

**Civil Engineering Faculty Award.** Junior membership in the ASCE or ASAE is awarded by the Engineering Faculty to a graduating Senior in Engineering on the basis of scholarship and promise of success in engineering. Selection is made by the Engineering Faculty.

**Virginia Dare Award.** A cash award of \$25 to the outstanding Junior in Dairy Manufacturing.

**Danforth Foundation Family Life Fellowships.** The first is awarded jointly by the Danforth Foundation and Ralston Purina Company to an outstanding Junior in the College of Family Life. The award provides for two weeks' study of business problems in St. Louis, followed by two weeks of leadership training at the American Youth Foundation Camp on Lake Michigan. The second is awarded by the



**Danforth Foundation** to an outstanding Freshman in Family Life. The award provides for two weeks leadership training at the American Youth Foundation Camp.

**Danforth Summer Award.** Awarded to an outstanding Freshman in Agriculture. This award covers the expenses of two weeks leadership training at the American Youth Foundation Camp on Lake Michigan. Transportation is up to the individual.

**Danforth Summer Fellowships.** Awarded to an outstanding Junior in Agriculture. This award covers the expenses of two weeks marketing and research study at St. Louis and at the Purina Research Farm nearby and two weeks leadership training at the American Youth Foundation Camp on Lake Michigan.

**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 in chemistry.

**Distinguished Service Awards.** Awards are given annually to outstanding students in Theatre, Music, Library, and Physical Education.

**Faculty Women's League Democracy Award.** This is awarded to Senior women. Candidates must have evidenced the best understanding of the democratic ideal in its application to University life, as exemplified by the following considerations: 1) awareness of issues vital to university life, 2) individual responsibility for their solution, and 3) accommodation of individual interest to what seems to be the common good. (University award winner excluded.)

**Faculty Women's League Scholarship Award.** Awarded to Senior women, based on scholastic records for full undergraduate work. To be eligible for this award, candidates must have spent at least two years at this institution. (Valedictorians excluded.)

**Farm Bureau Agricultural Leadership Award.** An award of \$200 to the Senior who has exhibited the greatest measure of growth and excellence in scholarship, constructive organization and leadership in the College of Agriculture throughout his university course. The winner's name will be engraved on the Caine Leadership Plaque.

**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 his undergraduate study.

**The Hawaiian Steamship Company's Challenge Cup.** Awarded each year to the student who shows the most proficiency in judging wool.

**Institute of Radio Engineers Award.** This award is made each year to the outstanding senior Electrical Engineer and IRE student member. The award consists of one year's dues as associate member of IRE and a certificate of achievement.

**The John K. Madsen Challenge Cup.** Awarded each year to the student who shows the greatest proficiency in judging sheep.

**Logan Kiwanis Club Trophies.** Each year, the Dean of each of the eight Colleges selects an outstanding student in his college to receive the Kiwanis Club Trophy.

**Mechanical Engineers Faculty Award.** An engineering handbook awarded annually to the Mechanical Engineering Senior with the highest grade point average. The award is made by the Mechanical Engineering faculty.

**Merck Award.** Merck and Company, manufacturing chemists, award annually a copy of the Merck Index to an outstanding student in Organic Chemistry and Biochemistry.

**The Ogden Union Stockyard Challenge Cup.** Awarded each year to the student who shows the most proficiency in judging beef cattle.

**Phi Upsilon Omicron Award to Freshman Students.** A charm necklace is given to a Freshman in the College of Family Life on the basis of scholarship, activities, and personality. The candidate must be a member of Zeta Epsilon.

**Proctor and Gamble Award.** A trophy is given to a graduating senior in the College of Family Life on the basis of scholarship, activities, and personality.

**Rolla M. Rich Memorial Award.** An award of \$50 to an outstanding student in Agriculture in the upper division, who is active in the LDS Church.

**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.

**The Salt Lake Union Stockyards Company Challenge Cup.** Awarded each year to the student who shows the most proficiency in judging hogs.

**Scholarship A's.** In the form of gold pins, these awards are given to students who present evidence that their grades are all "A's" for three consecutive quarters of their residence. At least fifteen credits exclusive of basic Physical Education and basic Military



Science must be carried. The grades of any quarter can be used but once towards a Scholastic Award.

**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.

**J. Fish Smith Award.** An award of \$100 for the promotion of international relations, given to a foreign student in recognition of excellence in scholarship and contribution to international understanding and good will.

**Son of Paul 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.

**United Business Education Association.** An award presented by the Smead Manufacturing Company to the Senior who has distinguished himself in Business Education.

**A University Award.** This award is conferred annually upon the male student of the institution who shows evidence of being able, in greatest measure, to repay the nation the investment which it has made in him, on the following basis: 1) The potential vocational or professional efficiency of the student as shown by his scholarly attainment, industry, and natural ability and talent (50 points) and 2) His patriotism, honesty, and good judgment as a student citizen, as an indication of his future attitude as a voter or public servant, combining a progressive spirit with a love of country and a concern for the safety and development of American institutions of liberty and justice and his qualities of social leadership as shown in student affairs, based upon physical and moral cleanliness and strength of character (50 points).

**A University Award.** This award is also conferred annually upon the woman student of the institution who shows evidence in greatest measure of 1) Potential vocational or professional efficiency as shown in scholarship, industry, and natural ability (50 points), and 2) Womanly qualities, development of the social graces (not necessarily social prominence), and attitude of mind (50 points).

**Utah Association of Certified Public Accountants.** An award for the purpose of stimulating interest to the outstanding Senior student majoring in Accounting.

**Utah Feed Manufacturing and Dealers' Association Award.** An award of \$100 to an outstanding Senior with a major in some phase of Animal Science, preferably one interested in Animal Nutrition.

**Utah Society of Professional Engineers.** An annual presentation of certificate of merit to the outstanding Senior Engineering student at USU.

**The Utah State University Science Medal.** A gift of the late Director Emeritus William Petersen, it is given each year to the student writing the best review of recent scientific research in either Mathematics, Physics, Chemistry, Geology, Zoology, Botany or Astronomy.

**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.

**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, 4) adjustment to meet the daily demands in character, social and general culture.

## Grants

The Educational Opportunity Grants Program, authorized by the Higher Education Act of 1965 provides that the University can award an educational opportunity grant to students of exceptional financial need. The University can grant to a student for each academic year, during which he is in need of grant aid to pursue his course of study, an amount not in excess of \$800. Freshmen who are selected for the grants must be enrolled as a fulltime student and judged capable of finishing a college degree. A student already attending Utah State must be in good standing and attending full-time. The student should not, but for a grant, be financially able to pursue a course of study at Utah State University.

## Loans

**Long-Term Loans.** An extensive loan program to assist students of limited financial means is supervised by the Office of Student Services. Utah State University is affiliated with the National Defense Education loan program.

To qualify, a student must be enrolled or have been accepted for enrollment as a fulltime student working toward a degree and must prove scholastic ability by maintaining a good academic standing. He must be in need of the amount of the loan to pursue the course of study.

Undergraduate students may borrow up to \$1,000 a year, to a total of not more than \$5,000. Graduate students may borrow \$2,500 per year, up to \$10,000. The total maximum loan to anyone during undergraduate and graduate study is \$10,000.

Under the program, repayment of principal and 3 per cent interest begins when the student has ceased his course of study.

A portion of the loan and interest thereon of any borrower who serves as a fulltime teacher for the full school year may be canceled.

Application forms for these long-term, low-interest loans may be obtained in Room 102 of the Main Building.

**Short-Term Loans.** It is the desire of USU that no student fail to complete school because of some temporary financial limitation. As a phase of the program of financial aid to students, small, short-term loans are made available on a business-like basis in Room 118 of the Main Building. Personal qualifications and need for financial assistance are the principal criteria.

Except in cases of extreme emergency no loans will be made during the last two weeks of any quarter, or a period of time exceeding the academic school year.

The total Student Loan Fund is composed of the following individual loan funds generously contributed by friends of USU.

**Clyde Foundation Loan Fund.** See Student Services for details.

**USU Faculty Women's League.** A loan fund for women students. Loans may range from \$25 to \$250. Preference is given to Senior students.

**USU Faculty Women's League Revolving Loan Fund.** A loan fund which provides for short time loans, not to exceed \$20, to women students for emergency purposes.

**Senior Loan Fund.** A gift of the class of 1911, and added to by the class of 1922, has helped many students complete school.

**Rotary Club Senior Loan Fund.** The Logan Rotary Club has provided a special loan fund to assist students in meeting expenses during their Senior year.

**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.

**W. B. Rice Memorial Loan Fund.** This loan fund provides loans up to \$200, usually for one year, to deserving students in the College of Natural Resources. Application is made to the Dean's office.

**Bureau of Land Management Loan Fund.** This provides loans up to \$100 to deserving students in the College of Natural Resources. Application should be made to the Dean's office.

**Marjorie Paulsen Loan Fund.** A fund provided by the father of a former Aggie student active in studentbody affairs.

**Ichel Water Loan Fund.** An individual gift to assist students in need.

**J. Reuben Clark Small Loan Fund.** A reserve specifically provided for assistance to students in meeting school obligations.

**O. W. Israelsen Loan Fund.** This loan fund is available to Senior Engineering students only. Application is made in the College of Engineering.

**Harold R. Kepner Loan Fund.** A fund established in memory of Professor Harold R. Kepner by his students and friends. Available through the general loan funds of the University.

**Eugene Santschi Loan Fund.** A fund established in memory of Eugene Santschi. The applications may be made through the NDEA Loan Fund of the University.

**John P. Holmgren Loan Fund.** A fund established in memory of John P. Holmgren. The applications may be made through the NDEA Loan Fund of the University.

## Placement Center

**Placement.** The primary function of the Placement Center is to provide assistance to Seniors and graduate students in their search for suitable career positions. Representatives of business, industry, government, and educational institutions are invited to campus to interview graduating students.

Information on job opportunities are provided. Brochures of employers are made available to explain career opportunities offered. Copies of student credentials are maintained and furnished to prospective employers.

The University is a member of the national College Placement Council (CPC) and the Association for School, College, and University Staffing (ASCUS). Through University affiliation with these national organizations, nation-wide computerized placement service and comprehensive directories of career opportunities are available to graduates of the University.

**Student Employment.** Help is provided to University students seeking summer jobs and parttime employment while attending school. A primary objective of the office is to help students become more effective in their search for work.

Many students are successful in finding a wide variety of parttime employment in offices, laboratories, buildings and grounds, and in the downtown and surrounding communities. Skills and experience are most important in determining whether the student's services will be used.

The placement office maintains a referral service for regularly enrolled students of the University and their wives. Departments needing assistance in filling available positions list their job openings at the Center. Students needing fur-

ther assistance are classified according to need, skills, and aptitudes for work and are referred to campus departments at the request of the employer.

Applications are not requested in advance, nor is it beneficial for a student to apply before he is actually in Logan and available for work. Employers are reluctant to employ students they have not met. For this and other reasons, the University does not make a job guarantee or commitment to any student in advance of his arrival at the University.

Jobs are available under the College Work-Study Program for academically qualified undergraduate students from low income families who must have financial assistance to pay college expenses. Applications for this program are requested in advance and may be obtained through the Financial Aids Office, Student Services, Main 102. Job assignments under this program are made by the Placement Center.

An undergraduate student may not earn more than \$100 per month in University employment. Students employed on assistantships are not eligible for work on an hourly basis without the approval of the President.

Students from foreign countries must obtain a work permit before they may be employed. Such permits may be acquired from the Foreign Student Adviser, Main 102, or the Immigration and Naturalization office in Salt Lake City, Utah.

Further information is available in the Placement Center, Room 310, Union Building.

## Counseling

Because students are faced with many problems throughout their University career, the services of

a staff of professional counselors are available to help students learn more about and better understand their own abilities, interests, personalities and emotions. These counselors assist students with their progress in college and with problems related to University life.

The Student Counseling Service, Old Main 101, offers specialized counseling and testing services to students who wish to learn more about themselves or who have personal problems which they would like to discuss with a professional counselor. Many of our University students have talked at some time with a counselor about educational problems, vocations they are considering, problems they have with study skills or personal situations involving dating, engagements, marriage or family relations.

A file of current information about occupations is also available to students. Students may use this information to investigate and appraise occupations in which they have an interest.

A close relationship with community and state agencies is maintained, so that whenever a counselor feels that a student might profit from these services an appropriate referral is made available.

## Health

A health service is provided for all registered students on the campus. The Student Health Service is located in the basement of the Union Building. The staff consists of one fulltime physician, two registered nurses and a receptionist. All Freshmen and transfer students are required to complete the Medical Examination Record and return it directly to the Office of Admissions and Records before a permit to register will be issued. Whenever possible the Medical Examination Record should be completed by the family physician.

University officials strongly urge students to purchase the Voluntary Student Accident and Sickness Insurance available to them at the time of registration. Included in the services available at the Student Health Service are medical and surgical care for minor illnesses and injuries, inoculations and immunizations, and limited laboratory facilities. Services not included are hospital care for non-emergency conditions, X-ray examinations or special prescriptions. Students not covered by personal or group insurance should not be without the student insurance.

In case of illness or emergency during office hours, students should notify or go directly to the Student Health Service. After office hours the student may call his private physician or the Logan LDS Hospital. If the student is unable to go to the hospital, he may call 752-2050 and a doctor will be recommended.

Medical care at the Student Health Service is free. Any further medical care beyond that provided at the Service must be paid for by the student or his insurance plan.

The Student Health Service is open from 8 a.m. to 12 noon and 1 p.m. to 5 p.m. Monday through Friday. Telephone: 752-4100 Ext. 435.

## Orientation

A program of activities has been designed to acquaint students with the life and environment of the University community. Participation in these orientation activities is required of all new students at the beginning of each quarter. In addition to group meetings for instruction in traditions, policies and procedures, there are opportunities for preregistration interviews with faculty and administrative personnel. Entertainment through movies, dances, mixers and game rooms of



the Student Union all reflect the many purposes for which this program is established.

At the beginning of each academic quarter each new student in the University who has not completed a full year of Freshman English, and who has less than 96 quarter credit hours, is required to have the results of the American College Testing Program Examination (ACT) on file with the University Counseling and Testing Service. The results are used by faculty and counselors to assist in placement, and as guidance aids.

### Foreign Student Advisement

Students from outside the United States are provided assistance for those problems related to immigration status and procedures through the office of Foreign Student Adviser. Assistance is also offered in personal and academic matters through all of the offices of Student Services. All students from abroad must register with the Foreign Student Adviser at the beginning of each quarter and must keep him informed concerning such matters as local address, change in student status, acceptance of employment, etc. Requests for extension of visa, work permits, immigration certifications, and money exchange letters must be submitted through the office of the Foreign Student Adviser. Students are urged to consult frequently with the adviser and to keep him informed of their problems and special needs. The Foreign Student Office is located in Main 10.

### Speech and Hearing Center

The Speech and Hearing Center offers limited service to University students, faculty, and individuals within the community. Under staff supervision, advanced students in training offer treatment for such

disorders as stuttering, misarticulation, foreign dialect, voice problems, and speech or language disorders resulting from central nervous system involvement. For enrolled University students this service is offered without charge. For others the service is on a fee for service basis. Extensive diagnostic service is also available to all on a fee for service basis. Students or others desiring service, either diagnostic or treatment, should contact the Director of Clinical Services, Department of Audiology-Speech Pathology, second floor, Mechanical Arts Building.

### Helpful Courses

Several courses are taught especially to help students with such personal affairs as marriage, food, clothing and finance. The description of these courses is found in the departments offering them. They include: Marriage and the American Family, FCD 20; Early Childhood, FCD 67; Family Finance, HEM 155; Home Management, HEM 149; Principles of Nutrition, FN 22; Pattern Design and Clothing Construction, CT 10; Clothing Selection for Men, CT 15; Design in Everyday Living, CT 5.

### Student Activities

**Intramurals.** The intramural program provides individual and team competition in badminton, basketball, golf, handball, horseshoes, pentathlon, swimming, softball, tennis, touch football, track and field, volleyball, weightlifting, winter carnival, and wrestling.

The purpose of the intramural program is to give each student unlimited opportunity for leadership, development of skills, sportsmanship, and good wholesome use of leisure time.



**Musicals.** Performances are given by band, orchestra, choral groups, and music clubs. These organizations present several concerts and recitals during the year, and participate in tours to the surrounding area.

**Theatricals.** Numerous productions are staged each year by student groups. Students participate in the lighting, staging, directing, and managing, as well as the acting.

**Debating and Public Speaking.** The University is a member of the Rocky Mountain Forensic League, and each year meets schools of this group in discussion. Participation in debate tournaments in the Intermountain and Pacific Coast Region provides opportunity for experience in tournament debating. Utah State is noted for its Mid-Winter Speech Meet.

**Student Publications.** Students publish a thrice-weekly paper, *Student Life*; a yearbook, *The Buzzer*; and a literary magazine, *Crucible*. *Blue Book*, the official student handbook which contains the Student Directory, is available to all regularly registered students. Some campus organizations sponsor publications of their own.

**Radio-Television.** The University owns and operates radio station KUSU-FM and television station KUSU-TV, both of which provide broadcast services available to students and the public, and both of which provide participation opportunities in broadcasting for qualified students registered in any course of study in the University.

KUSU-FM is managed by a staff member of the Radio-Television Department, but all department heads and operating staff positions are open to qualified students whose academic standing permits participation in extracurricular activities.

KUSU-FM broadcasts ten hours per day during regular school periods.

KUSU-TV operates on Channel 12 with 30,000 watts of power. The station broadcasts a daytime schedule of classroom programs available to the school systems of the area from September to June. The evening schedule continues year round transmitting national educational network programs in the areas of cultural and public affairs, as well as carrying an extensive schedule of programs featuring university and community resources, and exchange programs with other educational broadcasting stations. Television programs are also recorded in the USU studios for broadcast from other stations in Utah. Qualified students assist in all phases of television production.

KUSU-FM and KUSU-TV are under the direction of the Chairman of the University Radio-Television Department. Students interested in participating in these University broadcasting services should apply to that office.

**Utah State University Entertainment Bureau.** The Entertainment Bureau exists to provide entertainment to groups on and off campus. It is designed to encourage and assist students in the development of their talents and to arrange these talents, vocal, instrumental, dramatic, dance, or whatever, into programs. Students may apply for membership in one of the Bureau's eleven departments, including bureau assemblies, traveling assemblies, competitive assemblies, public affairs assemblies, civic programming, talent development, publicity, production, varsity show, student speakers and technical arrangements, or students may audition for performance opportunities.

Bureau programs travel throughout the Intermountain West, appearing before conventions, church and civic meetings, and area high

schools and colleges. The Bureau is directed by the program director. Offices are maintained in the Utah State Union.

The Bureau sponsors a wide variety of performing groups, including a fourteen-member folk singing chorus—the Balladiers, numerous duets, trios, and other kinds of singing groups, in addition to individual talent. A master file of all talent is maintained in the Bureau offices.

Program requests should be directed to the Program Director, Utah State Union, Room 426.

**Utah State Union Program Council.** The purpose of the Union Program Council is to provide students with the opportunity to plan and present activities and events which they would enjoy and to help develop their talents, creative abilities and leadership traits.

All students are encouraged to apply for membership in one of the following educational, cultural, recreational, or social committees: concert (sponsors concerts by national and internationally renowned artists, together with campus and off-campus chorales, bands, and orchestra groups); dance (plans studentbody evening and matinee dances); games (arranges campus tournaments, intercollegiate competitions, and professional exhibitions); gallery (schedules and displays exhibitions of paintings, prints, ceramics, sculpturing, and photographs of both local and national artists); hospitality (members serve as receptionists for campus visitors, as hosts for teas and receptions, conduct guided tours); movies (sponsors campus-wide entertainment movies); music (sponsors talent shows, stereo rooms); publicity (conducts all publicity for events in the total Union program); publications (responsible for planning, designing and preparing Union brochures, pamph-

lets, and programs); special events (sponsors all Union programs of a special nature); world culture (provides for displays and programs related to the varied cultural backgrounds of students enrolled at the University). Applications are accepted in the Student Union at the Activity Center.

## Student Government

**Associated Students.** All students of Utah State University, upon payment of student activity fees, become members and are therefore entitled to participate in and attend all activities sponsored by the association. Athletic events, musicals, dramas, dances, lyceums, etc., are events to which members of the ASUSU are admitted by activity card.

**The Executive Council** consists of six elected major officers of Associated Students: president, administrative vice-president, executive vice-president, financial vice-president, public relations vice-president and secretary. The council plays a major role in directing all student-conducted activities on campus.

**The Student Senate** is the legislative branch of student government and initiates policies for the welfare of the entire studentbody. Membership in the Student Senate includes: the Executive Council, the president of each of the four classes, a representative of each of the eight colleges, AWS president, three representatives of independent students, president of the Inter-Residents Council, an international representative elected by the foreign students on campus, the president of Panhellenic, president of Inter-Fraternity Council and a graduate representative student.

**Associated Women Students.** Every woman student properly registered and enrolled in the Univer-

sity is a member of AWS. This organization fosters interest and participation in campus activities. It is governed by its own elected officers and board.

#### **Governing Boards and Councils.**

The following boards and councils, composed of students and faculty supervisors, plan various campus activities: Women's Intramural Association, Men's Intramural Association, Athletic Council, Publications Council, Fine Arts Committee, Union Board, Union Program Council, Entertainment Bureau, Inter-Fraternity Council, Panhellenic Council, Independent Student Council, and Inter-Residence Council.

### **Student Organizations**

#### **Departmental and Professional**

**Agriculture.** Ag Clubs Council, Ag Economics Club, Agronomy Club, Alpha Tau Alpha, Alpha Zeta, Dairy Club, Horticulture Club, 4-H Club, Pre-Vet Club, Rodeo Club, Animal Husbandry Club.

**Business.** Alpha Kappa Psi.

**Chemistry.** American Chemical Society.

**Education.** Phi Kappa Delta, Student Education Association, Utah State Education Association.

**Engineering.** Engineering Council, American Society of Civil Engineers, American Welding Society, Industrial Teachers Education Club, Sigma Tau, Society of Automotive Engineers, Flying Techs, Institute of Electrical and Electronics Engineers, Theta Tau, American Society of Tool and Manufacturing Engineers, American Society of Mechanical Engineers.

**Forestry.** Foresters' Club, Forestry Wives, Xi Sigma Pi, Forest, Range, and Wildlife Council, Student Chapter of Wildlife Society, Student Chapter of Range Society.

**Geology.** Geology Club.

**History.** Phi Alpha Theta.

**Home Economics.** Phi Upsilon Omicron, Zeta Upsilon Club.

**Landscape Architecture.** Landscape Architecture Club, Student Chapter of the American Society of Landscape Architecture.

**Military.** Arnold Air Society, Pershing Rifles, Sponsors, Angel Flight, Sabre Squad, USU Rifle Team, ROTC Rifle Team.

**Music.** Band, Orchestra, Madrigals, University Marching Band, Varsity Band, Scotsmen Dance Band, University Symphony Orchestra, University Opera and Chamber Orchestra, Music Educators National Conference.

**Physical Education.** Badminton Club, Dance Club, PEMM (PE majors and minors), Ski Club, Square Dance Club, Swimming Club, Women's Intramurals Association, Men's Intramurals Association.

**Political Science.** International Relations Club, Pi Sigma Alpha, Pre-Law Club.

**Pre-Med.** Alpha Epsilon Delta.

**Psychology.** Psychology Club, Psi Chi.

**Sociology.** Sociology Club.

**Speech and Drama.** Tau Kappa Alpha, Theta Alpha Phi, Utah State University Speech and Hearing Association.

**Zoology.** Utazoa Club.

#### **Social and Special Interest**

**Fraternities, Social.** Alpha Gamma Rho, Delta Sigma Phi, Phi Gamma Delta, Pi Kappa Alpha, Sigma Alpha Epsilon, Sigma Chi, Sigma Nu, Sigma Phi Epsilon.

**Sororities, Social.** Alpha Chi Omega, Alpha Omicron Pi, Chi

Omega, Delta Delta Delta, Kappa Delta, Sigma Kappa.

**Recognition and Honorary.** Alpha Sigma Nu, Alpha Zeta, American Student Academy, Arnold Air Society, Pershing Rifles, Phi Alpha Theta, Sigma Phi Eta, Sigma Tau, Xi Sigma Pi.

**Regional.** Iranian Student Association, Association of Chinese Students, Canadian Club, Arab Student Association, Dixie Club, Weber, Indian Students Association, Pakistan Student Association.

**Religious.** Baptist Student Union, Campus Christian Fellowship (CCF), Canterbury Association, Delta Phi Kappa, Logan Unitarian Fellowship, Lutheran Student Fel-

lowship, Newman Club, Westminster Fellowship, Moslem Student Association, LDS Student Association.

**Scholarship.** Alpha Lambda Delta, Phi Alpha Theta, Phi Eta Sigma, Sigma Tau, Phi Kappa Phi.

**Service.** Blue Key, Angel Flight, Aggiettes, Circle K, Intercollegiate Knights, Sponsors, Spurs, Orchesis, Young Republicans, Young Democrats, Booster Club.

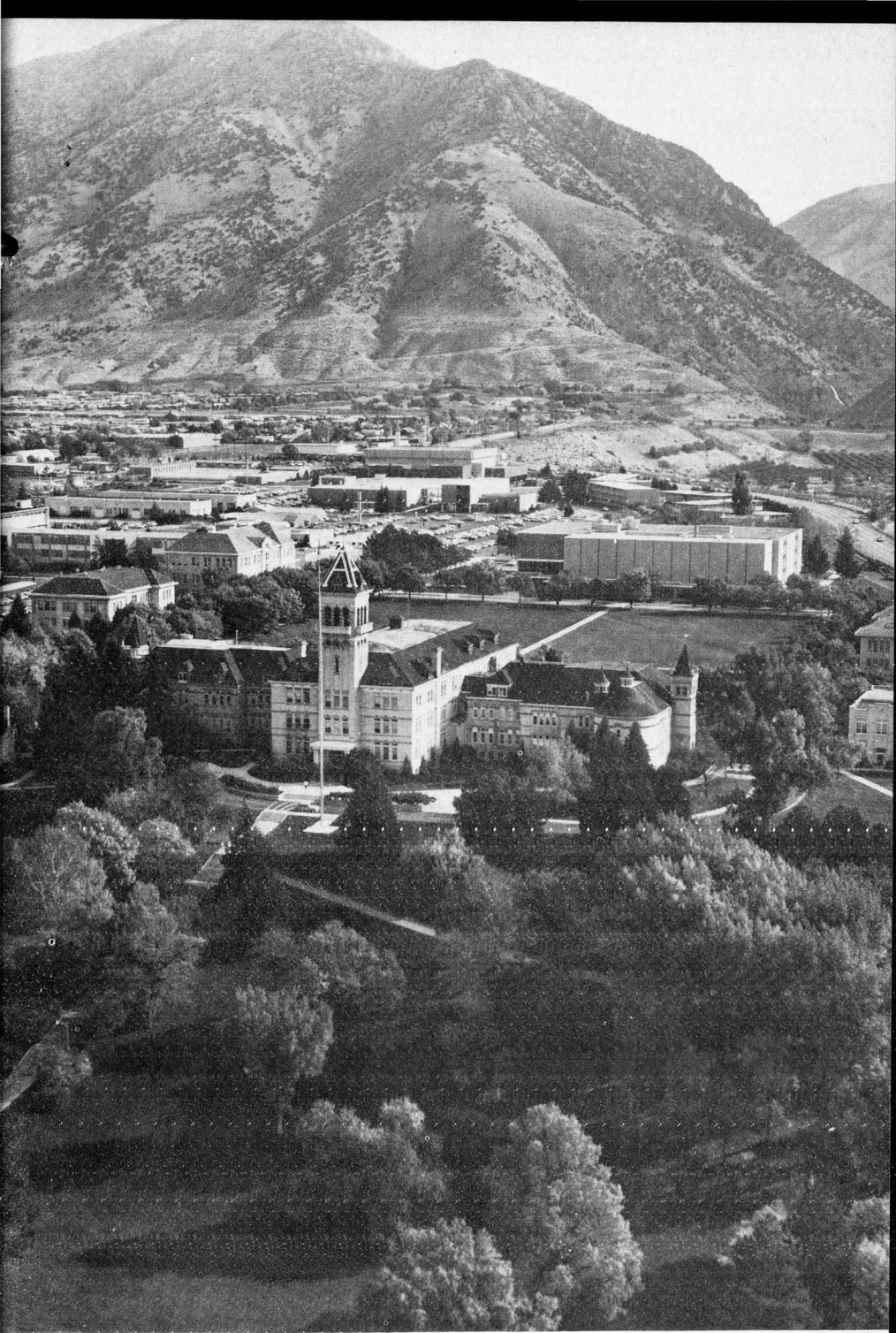
**Miscellaneous Social.** International Club, Human Relations Club, Independent Students Association, Cyclemen, Ski Club, Archery Club, Ham Radio Club, Photography Club, Moonshiners Square Dance Club.











*INSTITUTIONAL DEVELOPMENT*

# Institutional Development Programs

## General Program

Emanuel A. Floor, Director of Institutional Development

## University Publications

John J. Stewart, University Editor

Christian P. Nielsen, Extension Services Editor

Evelyn Lawrence, Assistant Extension Services Editor

Millard E. Wilde, Agricultural Experiment Station Editor

Donna Higgins, Utah Water Research Laboratory Editor

Gwen H. Haws, School of Graduate Studies Editor

Lois M. Cox, University Research Division Technical Writer

J. Lyn Larson and Gerald R. Sherratt, Alumni Association Editors

## University News Bureau

J. R. Allred, University News Editor

Sheryl S. White, Assistant University News Editor

Pam S. Baird, Editorial Assistant

Harvey Kirkpatrick, Sports Information Director

Christian P. Nielsen, Extension Services Editor

Cleon M. Kotter,<sup>1</sup> Extension Services Information Specialist

## University Radio and Television

Burrell F. Hansen, University Radio-Television Chairman

Boyd V. Humpherys, Radio-Television Chief Engineer

Arthur L. Higbee,<sup>1</sup> Extension Services Radio-Television Specialist

James Kay Randall, Extension Services Radio-Television Specialist

Lea Ward, Producer-Director, KUSU-TV

Gerald L. Allen, Assistant Manager, KUSU-TV

L. Jay Smith, Radio-Television Graphics Artist

## University Photography Service

Arlen L. Hansen, Director

## University Printing Service

Clark Kidd, Supervisor

## University Alumni Association

J. Lyn Larson, Director

## University Development Fund

Leron Johnsen, Director

## High School Relations Office

Richard Thorderson, Coordinator

## Entertainment and Speakers' Bureau

Richard B. Watkins, Student Program Coordinator

<sup>1</sup>On leave.

# Institutional Development Programs

## Office in Information Building

University Institutional Development programs include public information and development activities of the University. The University development program is a coordinated effort on the part of the institution to obtain the new resources necessary to achieve its long range goals.

Specifically, the objectives of the program are to maintain contacts with the public including alumni of the University, assist students in their quest for information about the University and seek the financial support for current operations and capital growth.

Good teaching, sound research and other practical services performed well are USU's chief means of public relations.

Being a public tax assisted institution, the University has the responsibility of keeping the public informed as to its operations. It can best fulfill this responsibility by utilizing the mass communication media of newspapers, magazines, radio and television stations, and by publishing appropriate bulletins and brochures.

## University Publications

University publications include:

- 1) A monthly University Bulletin series, devoted to the University Catalog, Graduate School Catalog, Summer Quarter Catalog, Correspondence Catalog, Audio-visual Aids Catalog, and bulletins featuring the various colleges and offerings of the University, and research by the Division of University Research and the Engineering Experiment Station.

- 2) Brochures for conferences, workshops and other events.

- 3) Extension Service circulars of an instructional type, in agriculture and homemaking especially.

- 4) Agricultural Experiment Station bulletins, reporting results of research.

- 5) **Utah Science**, a quarterly magazine of state-wide distribution, featuring research conducted by the University and its affiliated organizations.

- 6) A Monograph Series featuring essays and lectures of USU faculty members.

- 7) A quarterly university magazine containing news and features for USU Alumni.

- 8) Student publications, including **Student Life**, a tri-weekly newspaper; **Crucible**, a semi-yearly magazine, and **Buzzer**, the yearbook.

## University News Bureau

Information is disseminated daily and weekly through the press, radio and television. These releases include informational articles and programs of educational worth. They include articles on research in many fields and news of general campus events.

## University Radio-Television

The University radio and television stations, KUSU-FM and KUSU-TV, broadcast a daily schedule of educational, informative and entertaining programs in the Logan area, as well as preparing programs for use on commercial and other educational radio and television stations in Utah.

## USU Alumni Association

M. Ted Karren, **President**

J. Lyn Larson, **Director of Alumni Services**

Donna Everton, **Director of Alumni Records**

Office in Alumni Center, Student Union Building

Utah State University Alumni Association now numbers more than 40,000 members. These members are the graduates and other former students of Utah State, who are now keeping in touch with the University and supporting its activities through the work of the Association.

**Purpose.** It is the purpose of the Alumni Association to promote the interests and welfare of Utah State University.

**Membership.** 1) **Regular Member:** All persons receiving degrees, diplomas or terminal vocational certificates from Utah State University or Snow College are eligible for membership in the Association upon payment of dues. 2) **Associate Member:** All students who have been regularly enrolled in one of the two aforementioned institutions and have successfully completed any work therein, may become members of the Association upon payment of dues. 3) **Sustaining Member:** All parents of graduates or students and faculty members and others who have shown an interest in the University or the Association may become sustaining members by payment of dues. 4) **Honorary Member:** Persons eligible for honorary membership are those who have done outstanding service to the Institution and who are recommended for this honor by the Executive Committee, or the Council of the USU Alumni Association.

**Dues.** Annual dues are \$5 per year and joint annual dues (husband and wife) \$7.50 per year. Life membership may be obtained singly

at \$30, or \$50 for a joint membership, each payable in five annual installments.

**Government.** The governing power of the Association is vested in the Alumni Council, composed of 15 elected members and ex-officio members. The current president of the Senior class and the president of the Associated Students' organization are both ex-officio members of the Council. The Alumni Executive Secretary is the official representative of the Association on campus. The President of the Alumni Association is a member of the Utah State University Board of Trustees, as provided by Chapter 5, Article 75-5-0, School Laws, State of Utah.

**Function.** The Alumni Association is the medium through which former students of Utah State are kept in contact and are served after leaving the campus. Efforts are made to maintain a complete record of every alumnus throughout life, and his accomplishments and progress are recorded. Active members receive the Utah State **Alumnus**, an official publication of the Association, full of Aggie news and reports on the University. The Association maintains Alumni chapters in all major areas where Aggies are located. Through this local organization, Aggies 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 Association endeavors to keep in contact with all Aggies and assists them in reference and contact problems.



Membership in the Association is the best way for an Aggie to demonstrate his interest and support of the University and its program after leaving the campus.

The Alumni Association takes the leadership in sponsoring such campus events as Homecoming, Distinguished Service Awards, Reunions, and the Senior Reception, as well as aiding in athletic and other school events.

**Alumni Association-Library Endowment Fund.** The Library Endowment Trust Fund is a special fund which has been established by the Association. This fund was established from popular subscriptions. Earnings from the fund are given to the University library to aid it in the purchase of books which ordinarily could not be bought from the regular library budget.

## University Development Fund

Eldred Waldron, **Chairman**

Leron Johnsen, **Fund Director**

Office in Alumni Center, Student Union Building

A key part of USU's Development program is a Development Fund, a non-profit corporation (established August 11, 1958) to encourage grants, bequests, and gifts of money, property, works of art, historical papers and documents, and museum specimens having educational, artistic or historical value. The Development Fund thus helps the University increase and improve its educational and other services.

A fifteen-man board of directors of this non-profit corporation represents five groups: USU Board of Trustees, Alumni Association, the University Administration and Faculty, the Associated Students and General Public.

Functions and powers of the Board of Directors are: 1) to determine, after consultation with the President of the University or with a University officer designated by him, and after consultation with the Alumni Council of the Alumni Association, the specific University projects for which gifts of money or property will be solicited; 2) to obtain from alumni and former stu-

dents of the University and from other interested persons, corporations or foundations voluntary contributions to the University, and to establish such by-laws and policies as are necessary to carry out the purpose of the Fund; 3) to determine from time to time the methods of solicitation and publicity and to maintain the active interest of alumni and of the public in the Development Fund; 4) to elect and appoint such officers and committees and incur necessary expenses within its budget allowance as are needed for the proper accomplishment of its purpose; 5) to coordinate all University efforts relating to the Development Fund.

Solicitation programs of the Development Fund include: the "Fair Share Formula" used in the Annual Alumni Gift; the Century Club and the Old Main Society which recognize large single donors to the University's programs; and the Estate Planning Program for those wishing to bequeath property, securities, and money to the University in their wills.

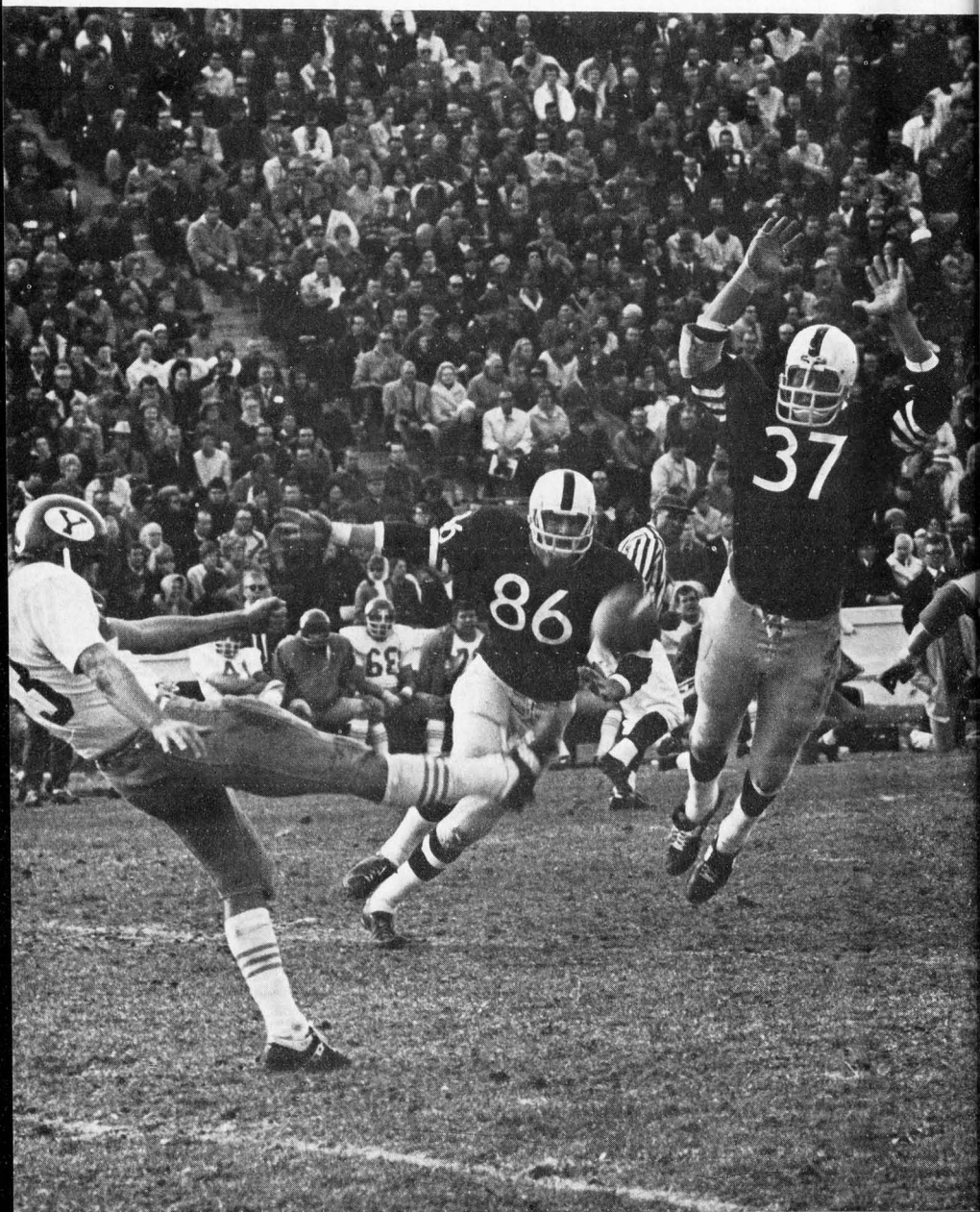


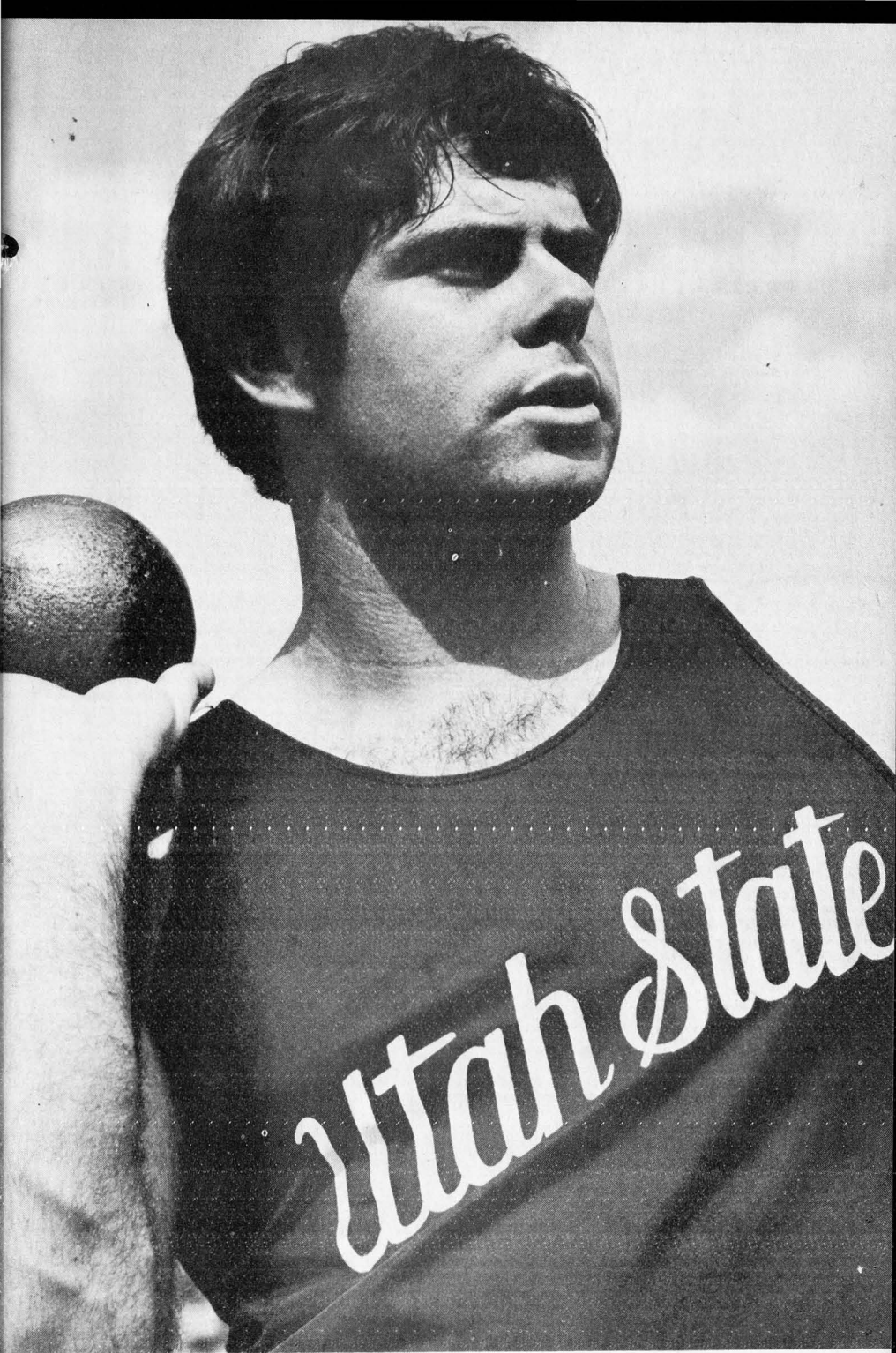
Those whose names are enrolled in the Old Main Society, as of January 1, 1968, include: Wilford F. Baugh<sup>1</sup> and Isabell P. Baugh, Hung Wo Ching and Elizabeth L. Ching, Orson A. Christensen and Rae N. Christensen, Paul M. Dunn and Neva K. Dunn, L. Boyd Hatch<sup>1</sup> and Anne M. Hatch, Edgar B. Mitchell and LaPrile B. Mitchell,

Gilbert C. Moesinger and Donna S. Moesinger, N. Glen Neeley<sup>1</sup> and Deta P. Neeley,<sup>1</sup> Val W. Palmer<sup>1</sup> and Alta R. Palmer, D. A. Skeen and Bertha K. Skeen, Obert C. Tanner and Grace A. Tanner, Eldred L. Waldron and Inez T. Waldron, and Gerald S. Wilson.

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<sup>1</sup>Deceased.





*INTERCOLLEGIATE ATHLETICS*

*Department of*

## Intercollegiate Athletics

**Director** Frank Williams; **Assistant Director** Dale L. Gardner; **Publicity** Harvey Kirkpatrick; **Ticket Manager** Tom Moulton; **Trainer** Howard Adams; **Equipment Manager** Ken Seamons; **Football** Chuck Mills, Head Coach; "Bo" Bollinger, Walt Corey, Chris Pella, Max McCartney, Al Prukop; **Basketball** LaDell Andersen, Head Coach; Dale Brown, Norvel Hansen; **Baseball** Jim Railey; **Golf** Dean Candland; **Tennis** Dale Brown; **Track** Ralph Maughan; **Swimming** Dale L. Gardner; **Wrestling** Chris Pella.

USU's Intercollegiate Athletics is organized under the rules and bylaws of the National Collegiate Athletic Association, and the Utah State University.

**Participation.** Varsity teams at USU schedule in the University division of the NCAA. Teams compete on a national and regional basis and are recognized for their successes. Fall quarter participation includes football, cross country, golf, and tennis. Winter quarter participation is basketball, wrestling, swimming, and indoor track. Spring quarter is spring football, baseball, track, golf and tennis. Qualifiers in any of these sports may represent USU in NCAA post-season activity.

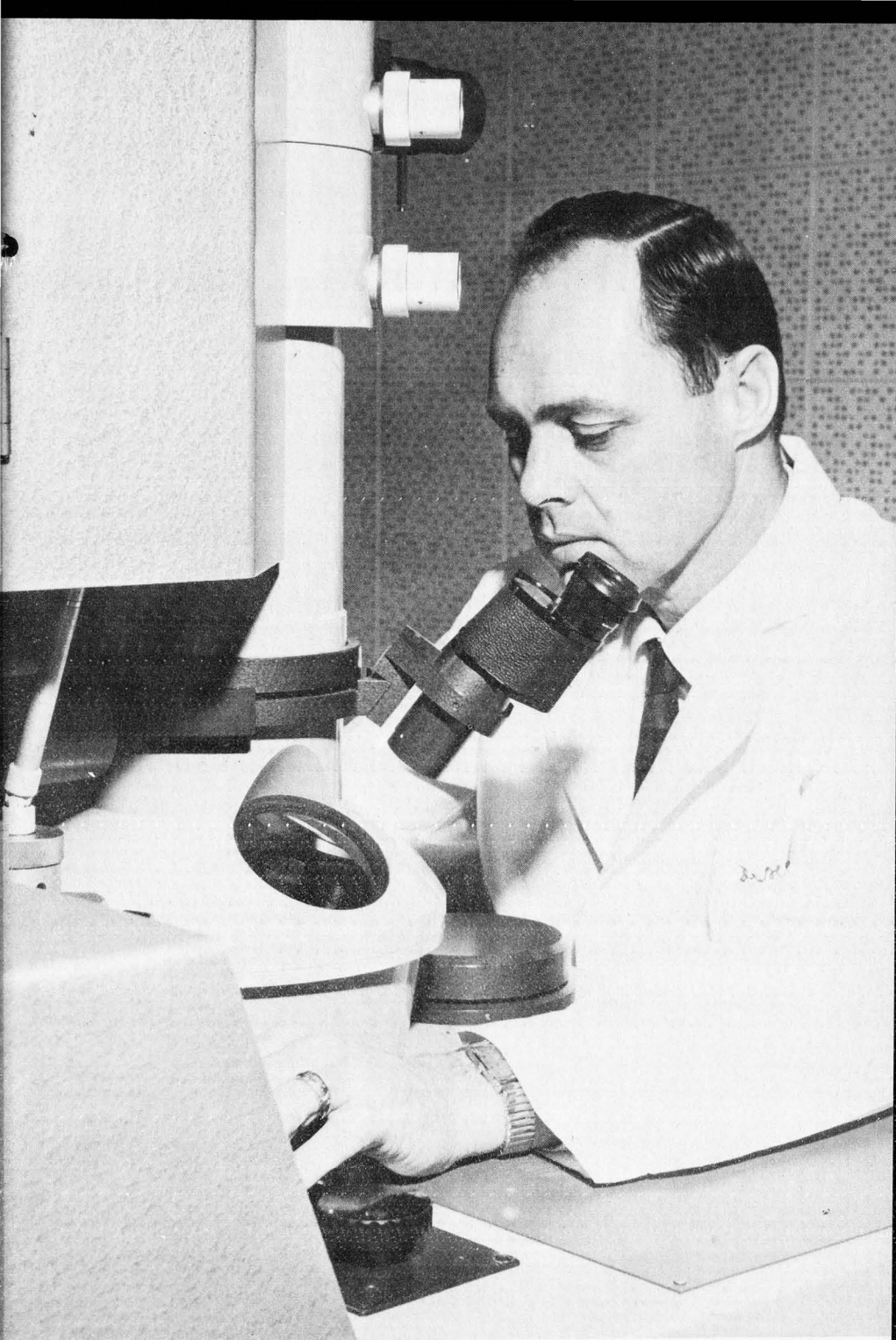
**Facilities.** Home football games are played in new Romney Stadium which seats 20,000. Basketball arena is the 6,000-capacity George Nelson Fieldhouse. The fieldhouse also has a practice area for football, baseball, golf, tennis, and an indoor running track. Golf course and ski areas are near the campus.

**Registration and Eligibility.** All male students at USU are encour-

aged to participate in the various varsity and freshman intercollegiate activities. Registration for participation may be accomplished by contacting any of the coaches or registering for the class work listed in the registration bulletin. Eligibility for participation is governed by rules and regulations established by the National Collegiate Athletic Association and by the Faculty Senate of the University.

**Awards and Grants-In-Aid.** USU offers awards and grants-in-aid in all sports for athletic excellence. A student or prospective student desiring consideration for one of these awards may contact one of the coaches for further application. Any awards granted will fulfill the arrangement between the coach and the recipient with approval of the Scholarship Committee.

**Supervision.** Supervision and direction of athletics for men 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.



*RESEARCH AND  
INSTITUTE PROGRAMS*



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Utah Cooperative Forest Recreation Research Unit, 408



# Research and Institute Programs

**Vice President, Research, D. Wynne Thorne; Chairman of Board, USU Foundation, D. Wynne Thorne; Director of Agricultural Experiment Station, K. W. Hill; Director, Engineering Experiment Station, Clayton Clark; Director Electro-Dynamics Laboratories, Doran J. Baker; Director, Utah Water Research Laboratory, Jay M. Bagley; Chairman, Utah Center for Water Resources Research, Dean F. Peterson; Chairman, Economic Research Institute, N. Keith Roberts; Acting Chairman, Ecology Center, John Neuhold; Institute for Research on Man and His Personal Environment, Norma H. Compton; Chairman, Bureau of Educational Research, James P. Shaver; Chairman, Management Institute, Calvin D. Lowe; Chairman, Institute of Utah Studies, S. George Ellsworth; Dean, School of Graduate Studies, Eldon J. Gardner; Leader, Utah Cooperative Wildlife Research Unit, Jessop B. Low; Leader, Utah Cooperative Fishery Unit, Robert H. Kramer; Leader, Utah Cooperative Forest Recreation Research Unit, J. Alan Wagar.**

Utah State University was among the first of the colleges and universities in the Intermountain area to have Research and Institute programs. Originally these were principally in agriculture. Now research and/or institute projects are in every college and almost every department of the University.

*Research and institutes are closely associated with teaching and student activities.* Most are conducted by staff members who are

also employed to teach part of their time. Many students, both graduate and undergraduate, 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 and institute operations are in several organizations. The principal organizations and areas of research and institutes are as follows:

## Division of Research

**D. Wynne Thorne, Vice President, Research**  
Office in Main 127

It is the policy of the University 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 is the responsibility of the University Research Council. Council members and the college or division each represents are as follows: Vearl R. Smith, Agriculture;

Bartell C. Jensen, Business and Social Science; James P. Shaver, Education; Doran J. Baker, Engineering; Norma Compton, Family Life; Carl T. Degener, Humanities

and Arts; C. Wayne Cook, Natural Resources; Grant Gill Smith, Science; K. W. Hill, Agricultural Experiment Station; Jay M. Bagley, Utah Water Research Laboratory.

## Utah State University Foundation

D. Wynne Thorne, **Chairman of Board**

Beverly D. Kumpfer, **Vice Chairman of Board**

Office in Main 127

This is a non-profit corporation organized in 1966 as an affiliate of Utah State University. The purpose is to assist in the development of the University as an educational and research center. The Foundation is authorized to administer special contracts for research, education and technical and scientific services and to develop and manage patents for the University.

Directors of the Foundation are:

Doran J. Baker, Dee A. Broadbent, Daryl Chase, JeDon A. Emenhiser, Eldon Gardner, Beverly Kumpfer, Dean F. Peterson, Norman D. Salisbury, and D. Wynne Thorne. The secretary-treasurer is LeMar Larsen. Members of the Foundation review program activities and elect four of the directors. Members are drawn to represent the several college divisions and Board of Trustees of the University.

## Agricultural Experiment Station

K. W. Hill, **Director**

Office in Agricultural Science 225A

The Agricultural Experiment Station is a major division of the University. It 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 and prepare food and fiber, and to develop and improve rural homes and rural living.

The investigations needed to fulfill Experiment Station responsibilities involve the full or part-

time services of about 130 professional staff members associated with 19 departments of the University: Agricultural and Irrigation Engineering, Agricultural Economics, Animal Science, Applied Statistics and Computer Science, Bacteriology and Public Health, Botany, Chemistry, Clothing and Textiles, Dairy Science, Food and Nutrition, Food Science and Nutrition, Forestry, Plant Science, Range Science, Sociology, Soils and Meteorology, Veterinary Science, Wildlife Resources, and Zoology. The staff includes about 60 employees of the U.S. Depart-

ment of Agriculture who are assigned to collaborate in agricultural research activities. A large number of undergraduate and graduate students are employed on a parttime basis to assist with the studies.

The Experiment Station investigations are organized into about 190 research projects. Some of the areas of research include: basic biology, breeding and testing of new and improved crop varieties; the diagnosis and control of plant diseases; the control of insects; diagnosis and control of diseases and parasites of animals; the breeding and nutrition of dairy and beef cattle, sheep and swine; breeding and testing improved lines of laying hens and turkeys; the feeding and nutrition of poultry; production of vegetable and fruit crops; weed control; mapping and classification of soils; fertilizing and managing soils; irrigation and drainage; managing watersheds and rangelands; forestry; wildlife management; conservation of water and soils; gathering snow survey data and predicting stream flows; research on processing and marketing of farm products; finding new or

improved uses of farm products; the economics of agricultural production; human nutrition; social relations of rural people; and recreation. The investigations range from applied field tests to fundamental research under controlled laboratory conditions.

Station research is periodically reviewed by advisory committees representing every segment of the agricultural industry. These committees evaluate the progress of research efforts and recommend problems in need of further study.

Main offices of the Agricultural Experiment Station are on the University campus in the Agricultural Sciences Building. Most of the research laboratories used by the Experiment Station are also on the campus, distributed among the various University buildings.

Field stations, farms, and research laboratories are operated in cooperation with College of Southern Utah at Cedar City, Snow College at Ephraim, and at about 14 other off-campus locations. Individual studies are conducted in cooperation with farmers, ranchers, retail stores, and many other business organizations.

## Engineering Experiment Station

Dean F. Peterson, **Dean, College of Engineering**  
Clayton Clark, **Director, Engineering Experiment Station**  
Office in Engineering Building C216

The Engineering Experiment Station is a major part of the College of Engineering. It has a broad purpose of furthering engineering sciences, engineering arts, and engineering education.

The Station was established in 1918 by the Board of Trustees. The Director is responsible for supervision and coordination of research in the various departments.

Staff members of the Civil, Electrical, Manufacturing, and Mechanical Engineering Departments, and the Industrial and Technical Education Department are also members of the Engineering Experiment Station. Staff members may be employed full or parttime on research.

The Station conducts basic and applied research in civil, electrical,

mechanical, tool and manufacturing, and agricultural engineering, as well as in industrial and technical education. Results of these studies are published in research bulletins, in engineering reports and papers, or otherwise made available to those interested.

In addition to the regular academic laboratories and facilities, the Engineering Experiment Station has the following specialized research laboratories and institutes under the supervision of the senior research staff as noted. Projects under these laboratories are financed by Federal Grants, Utah Uniform School Funds, and industry:

**Antenna and Radio Propagation Laboratory:** Dr. Ronny D. Harris, Dr. Robert L. Heyborne, Dr. Alan W. Shaw, Dr. Alvin M. Despain, Dr. Glen H. Smerage, Dr. Clayton Clark.

**Control and Simulation Laboratory:** Dr. Bruce O. Watkins.

**Cryogenics and Heat Transfer Laboratory:** Dr. Russell M. Holdredge.

**Electro-Acoustic Laboratory:** Professor Larry S. Cole, Dr. Clayton Clark.

**Fluid Mechanics and Gas Dynamics Laboratory:** Dr. Calvin Clyde, Dr. Gary Z. Watters, Dr. Roland W. Jeppson, Professor A. R. McKay.

**Magneto-plasma Dynamics Laboratory:** Dr. Edward W. Vendell, Dr. Ronney D. Harris, Dr. Alvin M. Despain, Dr. Bertis L. Embry.

**Soil Mechanics Research Laboratory:** Dr. Irving S. Dunn, Dr. R. K. Watkins, Dr. Fred Kiefer.

**Solid State Electronics Laboratory:** Dr. Wm. L. Jones, Professor W. Arnold Finchum, Dr. Alan W. Shaw.

**Structural Engineer and Mechanics Laboratory.** Dr. Winfred O. Carter, Dr. Alma P. Moser, Dr. Elliot Rich, Prof. Vance T. Christiansen.

**Structural Materials Research Laboratory:** Professor Wm. Cordon, Professor J. Derle Thorpe.

**Technical Education Research Institute:** Dr. Austin G. Loveless, Dr. William E. Mortimer.

## Electro-Dynamics Laboratories

Dean F. Peterson, **Dean, College of Engineering**

Doran J. Baker, **Director**

Alvin M. Despain, **Assistant Director**

Office in Engineering Building 264

The Electro-Dynamics Laboratories were founded at Utah State University in 1959 to perform research studies on aerospace electromagnetic radiation phenomena. The staff consists primarily of faculty and graduate students from the departments of Electrical Engineering, Physics, and Chemistry. The research programs of the three laboratories which make up EDL are closely tied into the grad-

uate programs of these academic departments. Most of the operating funds are obtained from federal contracts and grants, which have averaged about \$600,000 per year since the Laboratories were originally created in the College of Engineering.

**Stewart Radiance Laboratory.** This laboratory, with a professional staff of about twenty-five persons, is located in Bedford,

Massachusetts. Fundamental experiments are being conducted on the nonequilibrium electro-magnetic radiation from molecular beam collisions, chemiluminescence, and vibrational luminescence. Studies are being made to further the state of the art of interferometric spectroscopy. Ultraviolet, visible, and infrared measurements are being obtained from various geophysical and space phenomena using electro-optical instruments aboard rockets, satellites, and aircraft.

#### **Aerospace Radiation Laboratory.**

In this on-campus laboratory fundamental studies and experiments are being conducted toward a better understanding of various atomic and molecular mechanisms which lead to nonequilibrium radiation in the ultraviolet, visible, and infrared regions of the electro-magnetic spectrum. Present studies include atomic and molecular collisions, chemiluminescence, vibrational luminescence, aurora and airglow. Experiments have been carried out

which also involve equilibrium or thermal radiation, measurements from such sources as nuclear bursts, rocket exhaust plumes, and space vehicle reentry "signatures." Instrumentation has also been developed for accomplishing airborne infrared mapping of the earth's surface.

#### **Electro-Optical Engineering**

**Laboratory.** This on-campus laboratory was set up for the design and development of electro-optical instruments, instrumentation systems, and measurement techniques, primarily for aerospace applications. Studies are being conducted in interferometry, radiometry, and spectroscopy. Photometers, multi-channel radiometers, field spectrographs, and ultra fast scan spectrometers have been developed. Advanced measurement techniques are being developed by applying modern communication theory, including Fourier and statistical optics, to various radiation measurement problems.

## Utah Water Research Laboratory

Dean F. Peterson, Dean, College of Engineering

Jay M. Bagley, Director, Utah Water Research Laboratory

Calvin G. Clyde, Assistant Director

Office in Water Laboratory

The Utah Water Research Laboratory was authorized by the Utah State Legislature in 1959. It began as a separate program in 1963 using temporary facilities until completion of the laboratory building in September 1965. The Laboratory is one of the finest of its kind in the country. It provides 80,000 square feet of space planned for efficient and highly flexible use. It was built at a total cost of \$1,600,000 with funds supplied by the State Legislature, the National Science Foundation, and the National Institutes of Health.

### Physical Facilities

The Laboratory contains a variety of flumes and channels for conducting research in hydraulics and fluid mechanics. Flows up to 200 cfs, can be directed through the largest channel, which is more than 500 feet long. Flows can be provided under pressures of more than 250 pounds per square inch. Constant head tanks, weighing tanks, and volumetric tanks permit precise control, calibration, and measurement. The Laboratory has a well-equipped shop and



highly specialized shop technicians for constructing and maintaining experimental apparatus and equipment.

In addition to the hydraulic facilities, the Laboratory contains a specialized water quality laboratory, including modern equipment and instruments for performing a wide variety of biological, chemical and physical water quality analyses. Water pollution control and aspects of sanitary engineering comprise an important segment of the research program of the Laboratory.

Special laboratories are maintained for the development, testing, and maintenance of instrumentation essential to the precise measurement of many hydraulic, hydrologic, and climatic elements. Electronic devices are being developed for telemetering watershed information to a central headquarters; remote sensing of hydrologic phenomenon; measurement of fluid flow phenomenon (both air and water), and many other applications.

The Laboratory contains rooms for drafting and design, photo-mapping and interpretation, electronic analog modeling and other special project rooms. It also contains a library and printing room. Special purpose digital and analog computers and peripheral equipment provide utility and freedom in experimental application.

### **Scope of Research Activity**

The Laboratory serves as the research arm to many agencies that encounter water problems. It conducts research on a wide variety of water problems affecting agricultural, municipal, industrial and recreational users of water. Both basic and applied research are stressed.

Some 38 research projects are

underway under such broad categories as weather modification, geohydraulics of mountain streams, consumptive use and water requirements, mechanics of overland flow, hydrologic simulation by digital and analog computers, movement of water into and through soils, optimizing uses of surface and groundwater, hydraulic structures and measuring devices, water resource inventories, water resource planning methodology, hydro-climatic summaries, quality standards for water, water quality management and pollution control.

### **Financial Support**

The basic financing for research is provided from Uniform School Fund land-lease revenues. Federal, state and private grants and contracts provide the major portion of total research funding.

### **Academic Cooperation and Support**

The research staff of the Utah Water Research Laboratory represents a wide spectrum of water science and engineering specialties. These include fluid mechanics, and hydraulics, sanitary engineering, hydrology, chemistry, microbiology, meteorology, water resource planning and management, electronics, applied mathematics and other fields. Of the 34 professional staff presently employed, 22 hold joint appointments with academic departments. Many of the research projects are interdisciplinary in nature. Current research projects involve cooperation with staff from 10 different academic departments.

Research provides opportunity for graduate research assistantships and parttime student employment. Many graduate theses and dissertations are supported by laboratory research projects.

## Utah Center for

# Water Resources Research

Dean F. Peterson, **Chairman**; Jay M. Bagley, J. Whitney Floyd, K. W. Hill, Gene W. Miller, Vearl R. Smith, D. Wynne Thorne, **Council Members**; Howard B. Peterson, **Executive Secretary**.

The Utah Center for Water Resources Research was created by the Board of Trustees of Utah State University on November 23, 1964. The governing body of the Center is a Council composed of the deans of the colleges of Agriculture; Engineering; Natural Resources; and Science; the Vice President for Research; the Director of Agricultural Experiment Station, and the Director of Utah Water Research Laboratory.

The purposes of the Center are:

1) To coordinate University-wide research in the field of water resources as described by "The Water Resources Research Act of 1964."

2) To administer the provisions of the Water Resources Research Act as they relate to Utah State University and the state of Utah.

3) To encourage and foster the development of inter-departmental

research and educational programs to the water resources field.

All University staff members and collaborators engaged in water resources education or research are associates of the Center. The Center encourages development of instructional programs that will further the training of water resource scientists and engineers and implements programs related to water resources research in education both on and off the campus. It maintains liaison relationships with appropriate state, national, and international organizations and agencies having similar objectives, including the Universities Council on Water Resources. It is cognizant of the total program of water resources research of the University and its relationship to the activities of state and federal agencies and communities and conducts seminars on various aspects of water resources research needs.

## Economic Research Institute

N. Keith Roberts, **Director**

Bartell C. Jensen, **Associate Director**

Office in Agricultural Science 230

This is a research organization that promotes and coordinates research on economic and related problems. The Institute was organized in 1962 by action of the Board of Trustees and serves as a clearing house for ideas and methods related to research on economic and related

problems. It provides leadership in planning and conducting research and gives assistance to staff members in seeking financial support from other agencies interested in supporting research related to economic problems.

Membership in the Institute is

voluntary and limited to Utah State University staff members conducting research in economics or related fields. Associate membership in the Institute is open to staff members interested in seminars and other activities sponsored by

the Institute but who are not leaders in Institute-sponsored research projects.

The Director of the Institute is administratively responsible to the Vice President for Research.

## Ecology Center

John M. Neuhold, **Acting Director**

Office in Forestry and Zoology 225

The Utah State University Center of Ecology was established by the Board of Trustees on July 15, 1966. Its purpose is to promote and coordinate research and graduate study in the area of ecology. The Center was created at the request of and includes the Colleges of Agriculture, Natural Resources and Science and the Departments of Botany, Forest Science, Geology, Range Science, Soils and Meteorology, Wildlife Resources and Zoology. These departments are currently engaged in ecology research or training.

The creation of the Ecology Center recognizes that ecology is multidisciplinary requiring the coordination of biology and earth science programs. The objectives of the Center are:

- 1) To coordinate ecological research;
- 2) To coordinate course instruc-

tion and graduate training in ecology;

- 3) To provide an interdisciplinary focal point for graduate majors in ecology.

The Center currently has 37 active associates engaged in some form of ecology research or training, ranging from the aquatic to the terrestrial and including supporting areas. Much of the research and graduate training takes place on the USU campus. The entire northern third of the state of Utah provides the proximal outdoor laboratory. This laboratory includes such facilities as the Bear Lake Biology Laboratory, the USU School forest and its supporting facilities, the Logan River Biology laboratories and the Northern Desert Ecology Laboratory. A wide variety of ecological types ranging from the alpine to salt desert both aquatic and terrestrial communities are involved.

*Institute for Research on*

## Man and His Personal Environment

Norma H. Compton, **Director**  
Office in Family Life 303-A

The Institute for Research on Man and His Personal Environment was established in 1967 by action of the Board of Trustees. Its purposes are: 1) to study man as a totality with respect to his physical, social, and psychological responses to his man-made environment; to include principally clothing, textiles, home furnishings, and housing.

2) To encourage and foster the development of inter-departmental research in this field of study.

3) To provide research training for graduate students.

4) To conduct special forums stemming from research activities of the Institute.

## Management Institute

Calvin D. Lowe, **Director**  
Office in Mechanic Arts 212

In response to the educational needs of business and industry, the Management Institute of the College of Business and Social Sciences offers a variety of seminars, workshops, and conferences throughout

the year. These are all non-credit offerings and cover such materials as the management of small business, executive development, decision making, sales promotion and professional secretarial training.

## Institute of Utah Studies

S. George Ellsworth, **Director**  
Office in Main 317

By virtue of its Library holdings, its faculty, and research programs, Utah State University is a leading center for the study of all phases of Utah's historic and contemporary development. The Institute of Utah Studies has been established to collect and preserve the written and oral record of Utah's distant and recent past, of training persons in the use of the sources and literature of Utah history, and en-

couraging and assisting all persons, especially teachers and research writers in the social sciences and humanities, in the detailed study of any and all phases of Utah's development, and of offering courses and seminars in regular history. The Institute appeals especially to teachers desiring to specialize in the teaching of Utah history and to writers of historical and analytical studies of a regional nature.

Bureau of

## Educational Research

John C. Carlisle, **Dean, College of Education**

James P. Shaver, **Chairman, Bureau of Educational Research**

Office in Education 412-B

The College of Education maintains a Bureau of Educational Research which serves the following functions:

1) Coordinates research activities in the College of Education. The bureau cooperates closely with the Division of University Research and the School of Graduate Studies.

2) Plans and conducts educational research in problem areas of interest to Utah educators.

3) Provides information and research services to Utah educational administrators.

4) Represents the University in state-wide and nation-wide cooperative educational research projects.

5) Provides guidance and research source materials to graduate students in the College of Education.

School of

## Graduate Studies

Eldon J. Gardner, **Dean**

Office in Main 132

Each year at Utah State University approximately 500 students complete their work for an advanced degree. These degrees include the Master of Arts, Master of Fine Arts, Master of Business Administration, Master of Education, Master of Forestry, Master of Industrial Education, Master of Landscape Architecture, Master of Music, Master of Science, Civil Engineer, Irrigation Engineer, Doctor of Education, and Doctor of Philosophy.

In most cases, to qualify for one of these degrees the student must complete an intensive, carefully supervised research project and thesis in the area of his major interest. The data obtained in these research projects not only help qualify the

student vocationally, but also make a real contribution of knowledge and understanding in the area studied.

The thesis prepared from the research project is bound and micro-filmed and is permanently available in the University Library. New IBM listings in the Library will make available an in depth record of theses and dissertations by adding descriptions to the traditional author and title categories.

Abstracts of all theses are periodically published by the School of Graduate Studies. Often, scholarly or popular articles, based upon the thesis, are submitted to and published in various magazines and journals. Newspaper, radio, television, classroom, and



other uses are also made of these research findings.

Such projects in graduate studies have been conducted in, and made contributions to, a great variety of specific areas in agriculture, home

and family living, engineering, forestry, range and wildlife, business, social sciences, exact sciences, the arts and humanities, education—in fact, in nearly every subject taught at the University.

### Utah Cooperative

## Wildlife Research Unit

**Jessop B. Low, Leader**

Office in Forestry and Zoology 167

The Utah Cooperative Wildlife Research Unit was initiated in 1935 through a Memorandum of Understanding between the Utah State University, Utah Fish and Game Commission, Wildlife Management Institute and the U. S. Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife. The Unit's objectives are to:

- 1) Train students in wildlife management, research demonstration and administration.

- 2) Conduct research basic to proper utilization of wildlife and fisheries resources.

- 3) Promote wildlife education through demonstration, lecture, and publication.

- 4) Make results of investigations available to cooperators and the public.

Through the Research Unit's program in cooperation with the College of Natural Resources and the Department of Wildlife Resources, students are trained for state, regional and national positions in

wildlife management, research and other phases of natural resource conservation. Students whose studies are financed through the Unit program are selected from among high ranking candidates from institutions whose major training is in fish and wildlife management or biology, zoology, botany, agriculture or related fields.

Emphasis is given to training in resource management in waterfowl and marshland ecology, big game habitat and populations and habitat requirements, upland game bird ecology and habitat, fur bearing animal ecological and habitat requirements and conservation education. In addition to the regular cooperators, funding, equipment and supervision is secured from other state conservation agencies, as well as from such U.S. Government Bureaus and Departments as the U.S. Park Service, Bureau of Land Management, Intermountain and Rocky Mountain Forest and Range Experiment Station, Soil Conservation Service, U.S. Forest Service and others.

Utah Cooperative

## Fishery Unit

Robert H. Kramer, **Leader**  
Clair B. Stalnaker, **Assistant Leader**  
Office in Forestry and Zoology 279

A Utah Cooperative Fishery Unit was established at USU January 1, 1962, to conduct training and research in fishery science.

It was the first of twenty-three such units to be established in the United States.

Objectives of the program include teaching and training of fishery scientists and fishery management biologists and research related to problems of regional or national interest.

Cooperating in the Unit are USU, with its Department of Wildlife Resources; the Bureau of Sport Fisheries and Wildlife, U.S. Department of the Interior; and Utah State Department of Fish and Game.

Students financed by the Unit program receive graduate training for positions in fishery research, fishery administration and fishery management.

Utah Cooperative

## Forest Recreation Research Unit

J. Alan Wagar, **Leader**  
Wendell G. Beardsley, **Assistant Leader**  
Office in Forestry and Zoology 355

A Utah Cooperative Forest Recreation Research Unit was established at Utah State University in August, 1962. It was the first of four such units established in the United States. Objectives of the unit are to:

- 1) Train graduate students in recreation management and research.
- 2) Conduct and stimulate re-

search in the biological and sociological aspects of forest recreation.

Cooperating in the Unit are Utah State University with its Department of Forest Science, and the U.S. Forest Service's Intermountain Forest and Range Experiment Station.

The Unit is housed in the Forestry and Zoology Building, where it shares facilities and services with the College of Natural Resources.



*INTERNATIONAL PROGRAMS*

## International Programs

USU has a cosmopolitan campus, with more than 500 students from 50 foreign countries in attendance. It also conducts other educational programs both on and off campus

designed to further international understanding and the living conditions of peoples in other lands as well as in the United States. These programs include the following:

### Center for the Study of

## The Causes of War and Conditions for Peace

**Board of Governors:** Daryl Chase, **Chairman**; Roger B. Hansen, **Vice Chairman**; T. H. Bell, Peter W. Billings, Hugh B. Brown, Marriner S. Eccles, David W. Evans, Most Rev. Joseph Lennox Federal, E. Earl Hawkes, Esther Landa, O. C. Tanner, Maurice Warshaw, Rt. Rev. Richard S. Watson, Calvin L. Rampton (ex-officio).

**Directorate:** Milton C. Abrams, Theryl R. Black, Emanuel A. Floor, M. Judd Harmon; Gerald R. Sherratt. **Executive Secretary.**

Office in Library 141

The Center for the Study of the Causes of War and Conditions for Peace was dedicated on December 7, 1966. The governing body of the Center is the Board of Governors, while the Directorate administers the Center's programs.

The Center was established to focus the attention of the academic community on the issues and ideas contained in man's ageless search for peace. The Center serves to stimulate research studies, to assemble a comprehensive library of books and periodicals relating to the causes of war and conditions for

peace, to provide a meaningful dialogue between scholars and leaders in the various areas of international relations, to publish papers relating to the purposes of the Center, and to utilize the processes of education to promote the peaceful ordering of human affairs.

The Center sponsors an annual convocation held during Fall Quarter, as well as periodic seminars and institutes. The Center offers a course of study, War/Peace Collegium, offered each quarter of the academic year.

## East-West Institute

LeRoy A. Blaser, **Chairman**  
Office in Main 128

An East-West Institute is conducted annually at USU to foster improved understanding between East and West. Each year a well

known scholar on the Far East is brought to the campus for a series of lectures to students, faculty and townspeople.

Office of

## Latin American Affairs

B. Austin Haws, **Coordinator**  
Office in Library 202

USU is directing its major international programs toward Latin America, although short-term assignments are being continued in other parts of the world by USU

faculty members. An Office of Latin American Affairs was created, and a fulltime Coordinator appointed July 1, 1966.

Inter-American Center forThe Integral Development of  
Water and Land Resources

Bruce H. Anderson, **Director**

The Inter-American Center for the Integral Development of Water and Land Resources is operated for the Organization of American States by Utah State University in cooperation with the University of the Andes.

The Center was established in 1965 at Merida, Venezuela, for training Latin American leadership from the 20 member nations of OAS in water and land resources development. The curriculum and procedures developed by the Center allow maximum participation of the Latin Americans and the infusion of their background and experience into the program.

Curriculum being presented in-

cludes the philosophy of resource development; resource data collection and evaluation in terms of regional planning needs; principles and procedures of resource planning; logistics of project development, and successful project operation and management for optimum return.

The Center (commonly known in Latin America as CIDIAT, the initials of the Center's title in Spanish) presents this material in short courses designed for three levels of planners and implementers. Also a series of national training courses is being taught by the CIDIAT faculty in various countries on request.



Contract with

## USAID-USU-Bolivia

J. Clark Ballard, **Chief, USU Team in Bolivia**

USU signed a contract to provide technical assistance as a cooperating member of the USAID Rural Development team in Bolivia on July 19, 1965. Initially the contract provided for four USU specialists—an extension adviser, agricultural resources economist, forage specialist and livestock specialist—to serve two-year assignments in LaPaz, Bolivia. Since the contract was signed,

additional specialists have been added in education, cereals, water use and economics. The "Utah Team" in Bolivia now includes ten USU faculty members with their families. In addition, short-term consultants from the USU faculty have assisted in such areas as community development, animal breeding, entomology and education.

Partners of the

## Alliance for Progress Program

The University is cooperating with the Utah Committee for International Contact, a group of prominent Utah citizens, and count-

erpart committees in Bolivia to develop programs of mutual interest and benefit to citizens of Utah and Bolivia.

Program of

## Peace Corps Training

A unique relationship between the USAID team and the Peace Corps group in Bolivia has resulted from USU's contract to train Peace Corps volunteers for edu-

cation and agricultural extension assignments in Bolivia. USU has also trained Peace Corps groups for service in Venezuela, Iran and Morocco.

Contract with

## USAID-USU-Brazil

Lawrence Taylor, **Director at Natal, Brazil**

USU signed a contract with USAID for Rural Industrial Technical Assistance (RITA) in Brazil

on June 10, 1965. USU faculty members and students have spent two summers in Brazil working

with counterparts at the University of Rio Grande do Norte and with local Brazilian businessmen on the development of new small business-

es. Also two groups of Brazilians have come to USU for academic and practical studies of the businesses selected for establishment in Brazil.

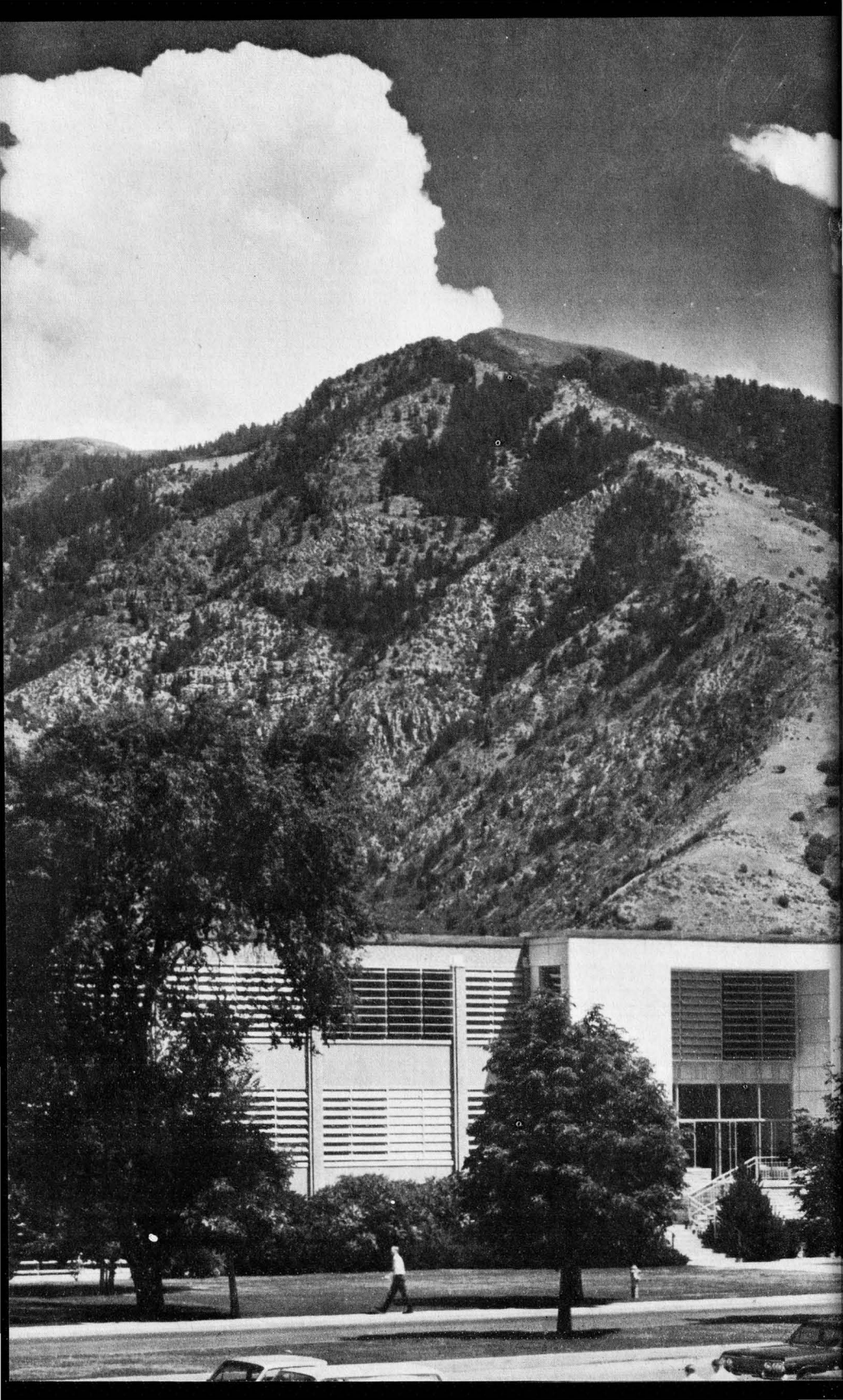
*Projects in*

## Cultural Exchange and Language Training

Since 1963 USU has had a contract with the University of the Americas in Mexico City to conduct a program known as **Spring Quarter in Mexico**. From 1963 through 1967, 133 USU students have participated in this educational program.

Since 1960, USU has conducted seven NDEA Spanish Language Institutes. In 1965 the Institute was conducted for the first time in Mexico. A second Institute was held in Mexico during the summer of 1967.







*EXTENSION SERVICES*



## Extension Services

**Director** W. H. Bennett; **Associate Directors** J. Clark Ballard,<sup>1</sup> Lloyd R. Hunsaker, Lloyd A. Drury; **District Directors** Marden Broadbent, William F. Farnsworth; **Supervisor, Extension Family Life Programs** Margaret B. Merkley; **Supervisor, 4-H and Youth Programs** Glenn T. Baird; **Associate Supervisor, 4-H and Youth Programs** Amy R. Kearsley; **Supervisor, Training and Evaluation** Stephen L. Brower;<sup>1</sup> **Leader, Community and Staff Development** Wesley T. Maughan; **Controller's Representative** Arthur Cahoon; **Secretary to Director** Libbie B. Maughan; **Youth Program Assistant** LaRee A. Petersen; **Bulletin Room Clerk** Laura P. Cheney.

### State Subject Matter Program Leaders

**Agricultural Engineering**, Wayne B. Ringer; **Agronomy**, Louis A. Jensen; **Animal Science**, Russell R. Keetch, Milton A. Madsen; **Clothing/Textiles**, Theta Johnson; **Consumer Information**, Carolyn Dunn; **Dairy Manufacturing**, Dee Morgan; **Dairy Science**, John J. Barnard; **Entomology**, Reed S. Roberts; **Farm/Economic Adjustments**, Lloyd A. Clement; **Foods/Nutrition**, Flora H. Bardwell; **Forestry/Outdoor Recreation**, Carl Johnson; **Graphic Artist**, L. Jay Smith; **Home Management/Furnishings**, Rhea H. Gardner; **Horticulture** (including Landscape Improvement), Arvil Stark; **Information and Publications**, Cleon Kotter;<sup>1</sup> Christian P. Nielsen, Evelyn R. Lawrence; **Marketing**, Morris H. Taylor, Paul R. Grimshaw; **Poultry Science**, C. I. Draper; **Radio-TV**, Arthur L. Highbee,<sup>1</sup> James K. Randall; **Range Management**, Karl G. Parker; **Resource Development and Public Affairs**, Leon C. Michaelsen; **Recreation**, Richard Boyce; **Rural Civil Defense and Safety**, Courtney H. Brewer; **Soil Science**, Paul D. Christensen; **University Defense (Urban)**, John L. Owen, Rulon Buck; **Veterinary Science**, Don W. Thomas; **Water Resources**, Richard E. Griffin; **Wildlife Resources**, Gar W. Workman; **Youth Programs**, Kay R. Bendixsen.

### County and Area Extension Agents

**Beaver**, Grant M. Esplin, Freida L. Harris; **Box Elder**, A. Fullmer Allred,<sup>2</sup> Jessie Eller, Ray Finch; **Cache**, Ray Burtenshaw, Bessie K. Lemon, Gerald R. Olson; **Carbon**, Rell Argyle, Arlene Erickson; **Davis**, Margaret Hall, Dorothy K. Hansen, L. Darrell Stokes; **Duchesne**, Mary Boender, Rex Morrell Mathis; **Emery**, Lavon Day, Elaine B. Hatch; **Garfield**, Harold Lindsay, Carmen Sudweeks; **Iron**, Marva W. Esplin, Wallace D. Sjoblom; **Juab**, Lynn Esplin, Clara Schofield; **Kane**, Harold Lindsay; **Millard**, Beth N. Crosland, Jay Hall, Margene B. Rowley; **Morgan**, Dorothy K. Hansen, William Lloyd Smith; **Piute**, Keith Chapman, Frances Price; **Rich**, Gerald Olson, Helen Wamsley; **Roosevelt District**, Wilta M. Crumbo, Max Sudweeks; **Salt Lake**, Melvin S. Burningham, Ruth Coates, Judith Loveless, Bernice Palfreyman; Joseph F. Parrish, D. Wayne Rose; **San Juan**, Ivan Blaine Jones; **Sanpete**, C. Dennis Funk, Delbert C. Purnell, Sarah Tuttle; **Sevier**, Suzanne Judd,

<sup>1</sup>On leave.

<sup>2</sup>Also doing work on area basis.



Rodney Rickenbach; **Summit**, Mary R. Bacon, J. Reed Moore; **Tooele**, Ernest O. Biggs, Naomi Jensen; **Uintah**, Carolyn Garrison, Nyle Mathews; **Utah**, Clair R. Acord,<sup>2</sup> Joel C. Barlow,<sup>2</sup> Robert L. Hassell, Irene G. Thompson, Emily Tyler; **Wasatch**, Mary R. Bacon, Paul R. Wayne, Keith Chapman, Claribell Webb; **Weber**, Fay W. Boyer, Elizabeth Darley, Lee S. Rogers, Norris Stenquist, Ruth Tippetts; **Six-County Area**, Marven Ogden; **Statewide Technician in Crops and Soils**, Ray Thatcher.

<sup>2</sup>Also doing work on area basis.

## Extension Services

Office in Agricultural Science 221

Utah State University's Extension Services include the Cooperative Extension Service, Extension Class Division, Conferences and Institutes Division and Correspondence Study Division.

### Cooperative Extension Service

The Cooperative Extension Service is one of the main divisions of the University and in Utah is the educational arm of the U.S. Department of Agriculture. It was established in 1914 with passage of the Smith-Lever Act by Congress. The 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 human leadership, resourcefulness and initiative; to supply factual information for discovering and solving problems, and to help people become more efficient, increase their incomes and raise their standards of living. The Extension Service takes the findings of research to the people of the state and brings unsolved problems back to the research workers at the University for solving.

Extension programs are planned jointly with the people. The demonstration method of teaching and the mass media are used extensively. Farm and home visits, group meetings, personal and circular letters and publications are used to supply educational information.

Several administrative and supervisory personnel and 30 subject-matter program leaders comprise the staff at the state office on the USU campus. In addition, several specialists and program leaders are located elsewhere in the state.

County Extension Agents are located in 27 of Utah's 29 counties. At present there are 64 Extension Agents serving on a county or area basis.

To facilitate operations the state has been divided into districts and a District Director placed in charge of each district to handle budget and relations matters in the districts and to supervise county Extension personnel and programs.

The Extension program includes work with both adults and youth. About one-third of the time of Extension workers is devoted to 4-H Club work.

**Programs emphasized are:** 1) efficiency in agricultural production; 2) efficiency in marketing,

distribution and utilization; 3) conservation, development and use of natural resources; 4) management on the farm and in the home; 5) family living; 6) youth development; 7) leadership development; 8) community development; 9) public affairs.

To train leaders and supplement the work done by Extension agents, the Extension Service sponsors free non-credit shortcourses and conferences in various subjects at the University and at other locations throughout the state. These shortcourses are usually planned and conducted under the joint sponsorship of the Extension Service and cooperating groups. Field days are also held in cooperation with USU's Agriculture Experiment Station and other groups.

### **Extension Class Division, Conferences and Institutes Division, Correspondence Study Division**

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 the Logan campus to register for resident courses. For this group, USU provides a liberal program of educational offerings, including Extension Classes, Correspondence Study, and a number of other educational services. USU is a member of the National University Extension Association.

#### **Extension Class Division**

Courses offered by Utah State University are made available in approximately thirty different communities of the state for groups of people who cannot take advantage of residence study opportunities at the Logan campus. Such courses are designated as **Extension Classes**.

They carry USU credit, are equivalent in content, hours of class instruction and preparation, and otherwise meet the same prerequisites as comparable classes on the University campus.

Except for the 45 credits which must be earned in residence on the Utah State University campus, Extension classes may meet the requirements for a Bachelor's degree. Extension classes also meet requirements for a Master's degree with approval of the School of Graduate Studies.

All instructors in Extension courses are either members of the regular University teaching faculty officially assigned to the teaching project concerned or non-resident members approved by the Head of the Department and by the University administration.

The registration fees charged for Extension classes conform to the prevailing regulations fixed by the Board of Trustees.

### **Conferences and Institutes Division**

The University cooperates with a variety of organizations in planning and sponsoring educational conferences and institutes.

These activities are offered primarily for those not planning to earn a degree. The Conferences and Institutes Division wishes to serve individuals desiring academic stimulation, new skills, greater appreciation of fine arts, and awareness of current national and international problems.

School districts are encouraged to organize teacher in-service and parent-teacher improvement programs.

### **Correspondence Study Division**

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 Correspondence Study courses in many of the 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 Correspondence Study courses of college level, 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 (45) may be earned by completing Correspondence Study courses. Each college of the University, subject to faculty approval, determines the nature and the amount of Correspondence Study credit accepted for admission and graduation. In no case is Correspondence Study credit to comprise more than 25 per cent of the total number of credits accepted for graduation.

**Graduation Deadline. Seniors** who plan to apply Correspondence Study credits toward graduation,

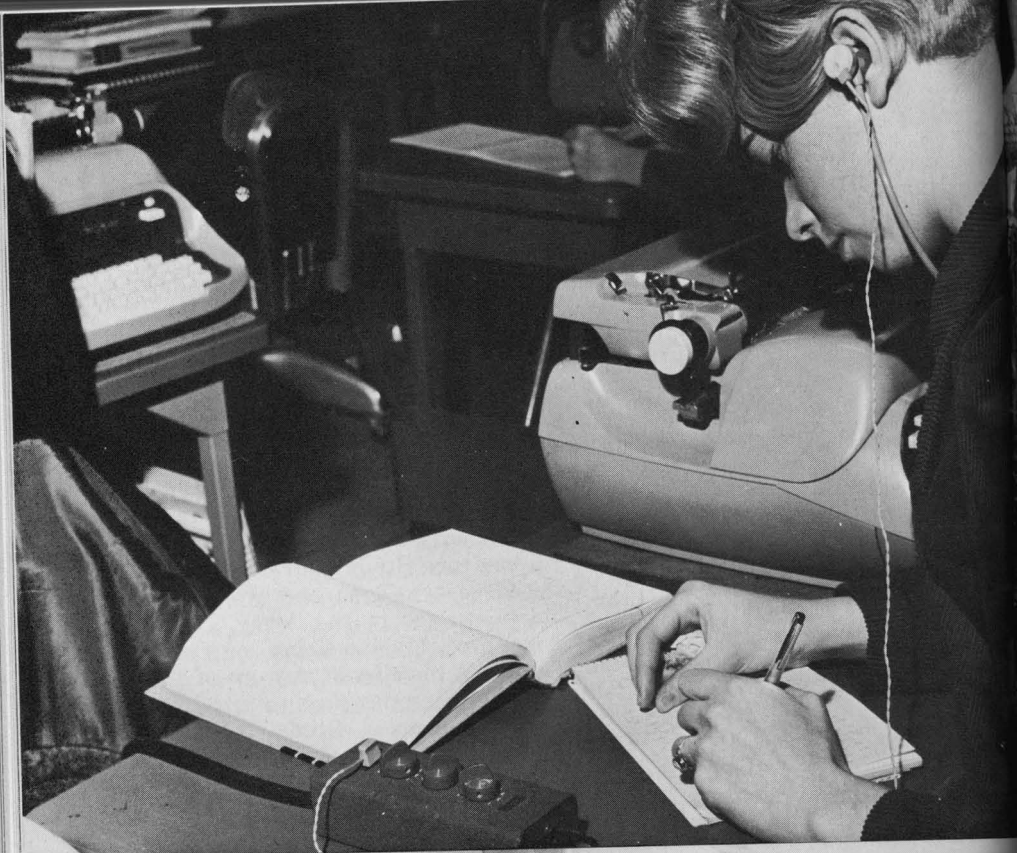
in any one year, must have their courses completed by May 1, so that lessons and examination may be evaluated and credit filed in the Admissions and Records Office two weeks prior to the day of graduation.

An enrollee is allowed one year in which to complete a course. An extension of time may be granted upon payment of a small fee.

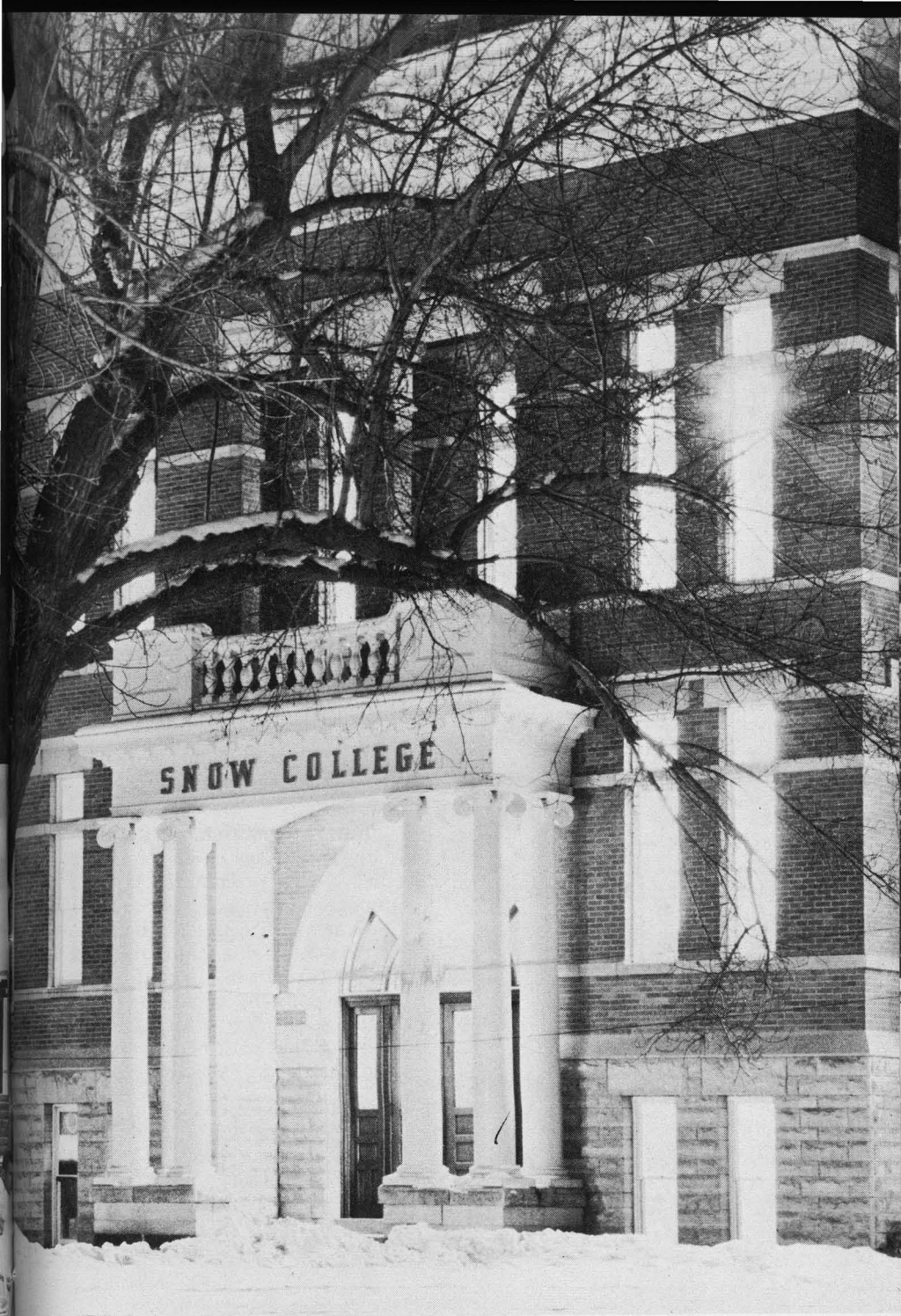
**USAFI Courses.** USU cooperates with the United States Armed Forces Institute (USAFI) at Madison, Wisconsin, in providing Correspondence Study courses at a reduced cost to men and women in active service in the Army, Navy, Air Force, Marine Corps, or Coast Guard. A member of any one of the armed forces desiring to enroll in Correspondence Study courses should contact the education center or information center at the base where he is located.

**Fees.** A fee of \$10 per credit is charged for Correspondence Study courses of college level. High school course fees are \$26 per credit and \$18 per half credit. All fees are subject to change.

**Correspondence Study Catalog.** Anyone interested in Correspondence Study may request a catalog, containing complete information concerning this program by writing to the Correspondence Study Division.







*SNOW COLLEGE*



# Snow College

Floyd S. Holm, **President**

Snow College was founded in 1888. It was originally known as Sanpete Stake Academy and was operated by The Church of Jesus Christ of Latter-day Saints. The institution became known as Snow Normal College in 1912 and as Snow Junior College in 1922. It was operated as a state junior college from 1932 until July 1, 1951, when it became a branch of Utah State University.

It is governed by the Board of Trustees of Utah State University and is administered by the President of the University through a resident director who is responsible directly to the President.

**Location.** Snow College is located adjacent to Highway 89, at Ephraim, which is at the approximate geographic center of Utah.

**Accreditation.** Snow College is accredited by the Northwest Association of Secondary and Higher Schools.

**Campus and Facilities.** The main campus of Snow College consists of 55 acres including an athletic field, and 17 buildings. In addition to the main campus, Snow College cooperates with the Experiment Station in the operation of a 96-acre college farm.

**Degrees and Certificates.** Snow College is authorized to confer the certificates of Associate in Science and Associate in Arts upon com-

pletion of a two-year college program. Students who follow terminal curricula are awarded a two-year certificate of completion.

**Curricula.** Snow College is authorized to teach lower division courses in all basic areas of instruction.

Courses offered at Snow College parallel lower division courses offered at Utah State University. Course numbers generally coincide with those listed at Utah State University. A student may complete all lower division requirements at Snow College and transfer to Utah State University for completion of upper division work. Course instruction is offered in divisions and departments which correlate with lower division work in the academic colleges on the Logan campus.

**For Information.** A special catalog for Snow College is issued each year. It contains a detailed announcement of all curricula, statement of courses, entrance requirements, rules and other general information about the college. For a copy of the Snow College catalog, or for information concerning the work of Snow College, address:

President's Office  
Snow College  
Ephraim, Utah 84627



*FACULTY AND COLLABORATORS*

# Utah State University 1968-69 Faculty

**ABRAMS, MILTON C.** (1949) Librarian; Prof. of Political Science and Library Science. BS 1948, MS 1952 Utah State University, PhD 1963 University of Utah.

**ACORD, CLAIR R.** (1947) Prof., Extension Services; Extension Agent. BS 1937 Utah State University, MS 1956 University of Illinois, PhD 1967 University of Kentucky.

**ADAMS, HOWARD** (1967) Head Trainer for Intercollegiate Athletics. BS 1965 Utah State University.

**ADAMS, WALTER DALE** (1967) Instr. in Psychology. BA 1948, MA 1951 University of Denver.

**ADKINS, BRYCE E.** (1964) Asso. Prof. of Elementary Education. AB 1949 Peru State College, MA 1954, PhD 1958 State University of Iowa.

**AHLSTROM, C. BLYTHE** (1964) Instr. in History. BS 1958, MA 1961 Columbia University.

**ALDER, DOUGLAS** (1963) Asst. Prof. of History. BA 1957, MA 1959 University of Utah, PhD 1966 University of Oregon.

**ALGER, TERRY DEAN** (1967) Asst. Prof. of Chemistry. BS 1962, PhD 1966 University of Utah.

**ALLEN, GERALD L.** (1961) Acting Manager KUSU-TV and Acting Chairman Radio-TV Instruction in Speech. BS 1960, MS 1964 Utah State University.

**ALLEN, J. WHORTON** (1964) Instr. and Couns. in Student Services. BS 1955 Brigham Young University.

**ALLEN, ROSS R.** (1966) Asso. Prof. of Secondary Education. BS 1952, MS 1955, EdD 1962 University of Utah.

**ALLRED, A. FULLMER** (1945) Asso. Prof., Extension Services; Extension Agent. BS 1938 Brigham Young University, MS 1966 Utah State University.

**ALLRED, E. MALCOM** (1961) Head, Dept. Elementary Education; Prof. of Education. BA 1948 Southern Idaho College of Education, MS 1953 University of Idaho, EdD 1961 Colorado State College.

**ALLRED, J R** (1958) University News Editor; Asst. Prof. of Journalism. BA 1950 University of Utah, MS 1964 Colorado State University.

\***ALLRED, KEITH REID** (1957) Prof. of Agronomy. BS 1951 Brigham Young University, PhD 1955 Cornell University.

**ANDERSEN, LADELL** (1961) Head Basketball Coach; Instr. in Physical Education. BS 1951 Utah State University.

\***ANDERSON, BRUCE** (1961) Prof. of Irrigation Engineering and Director CIDIAT, Merida, Venezuela. BS 1950, MS 1954 Utah State University, DEng 1963 University of California.

**ANDERSON, J. LAMAR** (1961) Asso. Prof. of Horticulture. BS 1955 Utah State University, PhD 1961 University of Wisconsin.

**ANDERSON, JAY O.** (1951) Prof. of Animal Science. BS 1943 Utah State University, MS 1948, PhD 1950 University of Maryland.

**ANDERSON, JON I.** (1964) Asst. Prof. of Art. BPA 1956 Art Center School.

**ANDERSON, RICHARD C.** (1963) Asst. Prof. of Chemistry. BS 1954, PhD 1961 Brigham Young University.

**ANDERSON, ROICE H.** (1947) Prof. of Agricultural Economics. BS 1935 University of Wyoming, MS 1941, PhD 1943 Cornell University.

**ANDERSON, THOMAS CLARK** (1967) BS 1965, MS 1966 Utah State University.

**ANDERSON, WENDELL B.** (1947) Prof. of Political Science. BS 1935, MS 1940 Utah State University, LLB 1941 George Washington University.

**ANDRA, JEAN** (1962) Instr. in English. BS 1961, MA 1964 Utah State University.

**ANDRA, THEODORE** (1961) Asst. Prof. of English. BS 1961, MA 1963 Utah State University.

**ANDRE, RICHARD J.** (1967) Asst. Prof. of English and Journalism. BA 1957, MA 1959, Stanford University.

**ANDREWS, WADE H.** (1965) Prof. of Sociology. BS 1947, MS 1949 Utah State University, PhD 1956 Michigan State University.

**ARAVE, CLIVE WENDELL** (1964) Asst. Prof. of Dairy Science. BS 1956, MS 1957 Utah State University, PhD 1963 University of California.

**ARGYLE, RELL F.** (1954) Asso. Prof., Extension Services; Extension Agent. BS 1940 Utah State University, MED 1964 Colorado State University.

\*On leave.

NOTE: Date in parentheses indicates year the person joined USU staff, not necessarily in present position.

**ARNEKLEV, BRUCE LEON** (1966) Instr. and Couns. in Student Services. BS 1959, MS 1966 University of Oregon.

**ARRINGTON, LEONARD J.** (1946) Prof. of Economics. BA 1939 University of Idaho, PhD 1952 University of North Carolina.

**ASHCROFT, GAYLEN L.** (1961) Asso. Prof. of Soils and Meteorology. BS 1953, MS 1955 Utah State University, PhD 1962 Oregon State University.

**ASPLUND, JOHN M.** (1966) Res. Asso., Agricultural Experiment Station. BS 1951, MS 1957 University of Alberta, PhD 1960 University of Wisconsin.

**ATKINSON, SHERWIN J.** (1958) Res. Asso., Animal Science. BS 1955 Utah State University.

**AUSTIN, LLOYD HALE** (1967) Res. Eng., Utah Water Research Lab. BS 1967 Utah State University.

**BACON, MARY R.** (1948) Asso. Prof., Extension Services; Extension Agent. BS 1928 University of Utah, MS 1964 Brigham Young University.

**BAGLEY, JAY M.** (1954) Prof. and Director of Utah Water Research Lab. BS 1952, MS 1953 Utah State University, PhD 1964 Stanford University.

**BAHLER, THOMAS L.** (1949) Prof. of Zoology, Physiology. BA 1943 College of Wooster, PhD 1949 University of Wisconsin.

**BAIRD, GLENN T.** (1946) Supv. 4-H and Youth Programs; Asso. Prof., Extension Services. BS 1935 Utah State University, MS 1964 University of Maryland.

**BAKER, DORAN J.** (1959) Director, Electro-Dynamics Lab.; Prof. of Electrical Engineering. BS 1953, PhD 1956 University of Utah.

**BAKER, GERALD M.** (1965) Asst. Prof. of Botany. BA 1956 Williamette University, MA 1959 Indiana University.

**BALLAM, ORAL L.** (1963) Assistant to the Dean; Asso. Prof. of Education. BS 1949, MS 1955 Utah State University, EdD 1961 University of California at Los Angeles.

**\*BALLARD, J. CLARK** (1959) Prof., Asso. Director, Extension Services. BS 1947 Utah State University, PhD 1950 Cornell University.

**BALPH, DAVID F.** (1964) Asst. Prof. of Wildlife Resources. BA 1955 Hiram College, MS 1961, PhD 1964 Utah State University.

**BARDWELL, FLORA H.** (1950) Asso. Prof., Extension Services; Food and Nutrition Specialist. BS 1940 Brigham Young University, MS 1963 Utah State University.

**BARLOW, JOEL C.** (1946) Asso. Prof., Extension Services; County Extension Agent. BS 1938, MS 1963 Utah State University.

**BARLOW, WAYNE K.** (1962) Res. Engineer, Electro-Dynamics Lab. BS 1960 Utah State University.

**BARNARD, JOHN J.** (1936) Dairy Specialist; Asso. Prof., Extension Services. BS 1933 Utah State University, MS 1959 University of Wisconsin.

**BARON, GLEN L.** (1958) Instr. in Landscape Architecture. BS 1958 Utah State University.

**\*BARTEL, CARL R.** (1959) Prof. and Head of Industrial and Technical Education. BS 1949, MS 1952 Kansas State University, EdD 1959 University of Missouri.

**\*BATTY, JOSEPH CLAIR** (1963) Asst. Prof., Mechanical Engineering. BS 1961, MS 1963 Utah State University.

**BAUGH, FRANCIS** (1952) Purchasing Agent. BS 1950 Utah State University, Diploma 1958 National Association of Educational Buyers.

**BEAN, RICHARD B.** (1965) Instr. in English. BA 1961 Brigham Young University, MA 1965 Utah State University.

**BEARDSLEY, WENDELL G.** (1966) Asst. Res. Prof. of Forest Science. Federal Collaborator. BS 1962, MS 1965 University of Minnesota.

**BEECHER, ASA L.** (1945) Records Officer in Office of Admissions and Records; Veterans' Coordinator. Attended Henager's Business College.

**BELNAP, GORDEN** (1967) Instr., Special Education and Health, Physical Education and Recreation. BS 1958, MS 1965 Utah State University.

**BENBOW, JERRY L.** (1967) Asst. Prof., Languages and Philosophy. BA 1959, MA 1964 Ohio University.

**BENDIXSEN, KAY R.** (1952) Asso. Prof., Extension Services; Extension Agent. BS 1941, MS 1952 Utah State University, PhD 1965 Michigan State University.

**BENNETT, JAMES A.** (1945) Prof. and Head, Dept. of Animal Science. BS 1940, MS 1941 Utah State University, PhD 1957 University of Minnesota.

**BENNETT, WILLIAM H.** (1937) Director, Extension Services; Prof. of Soils and Meteorology. BS 1936, MS 1948 Utah State University, PhD 1957 University of Wisconsin.

\*On leave.



**BENSON, SERGE N.** (1964) Lecturer in Business Law, Business Administration. BS Utah State University, JD 1934 Washington University.

**BERG, FREDRICK S.** (1965) Asso. Prof. of Speech and Special Education. BS 1952 Washington University, MS 1956, PhD 1960 Southern Illinois University.

**BERTOCH, MICHAEL** (1967) Asst. Prof., Psychology. BS 1957, MEd 1958 Idaho State University, EdD 1967 Boston University.

**BEUTLER, G. LEON** (1954) Asst. Prof. of Instructional Media and Library Science. BS 1950, MS 1959 Utah State University.

**BEYERS, CORALIE** (1964) Lecturer in English and Journalism. BA 1948, MA 1950 University of Utah.

**BEYERS, JOHN M.** (1957) Asst. Prof. of Languages and Philosophy. BA 1949, MA 1953 University of Utah.

**BIDDULPH, GWEN B.** (1965) Instr. in Home-making Education. BS 1934 Brigham Young University, MS 1965 Utah State University.

**BIGGS, ERNEST O.** (1944) Asst. Prof., Extension Services; Extension Agent. BS 1926 Utah State University.

**BISHOP, A. ALVIN** (1946) Prof. and Head of Agricultural and Irrigation Engineering. BS 1934, MS 1938 Utah State University, PhD 1961 Colorado State University.

**BISHOP, MALCOM G.** (1966) Asst. Prof. of Landscape Architecture and Environmental Planning. BS 1962 University of Massachusetts, MLA 1964 University of Michigan.

**BLACK, FARRELL J.** (1961) Instr. in Speech. BS 1959, MS 1962 Utah State University.

**BLACK, THEREL R.** (1950) Prof. and Head, Dept. of Sociology, Social Work and Anthropology. BS 1939 Brigham Young University, MA 1941 Louisiana State University, PhD 1951 University of Wisconsin.

**BLACKBURN, VIRGINIA LEE** (1966) Instr., Extension Services, Extension Agent. BA 1966 Brigham Young University.

**BLAKE, JOSEPH T.** (1956) Asso. Prof. of Veterinary Science. BS 1949 Brigham Young University, MS 1950, PhD 1955, DVM 1956 Iowa State University.

**BLASER, LEROY A.** (1952) Director of University Personnel, Prof. of Education. BS 1936, MS 1944 Utah State University, EdD 1955 University of California.

**BOENDER, MARY** (1936) Asst. Prof., Extension Services; Extension Agent. BS 1933 Utah State University.

**BOOTH, THORNTON Y.** (1953) Head and Prof., Dept. of English and Journalism. AB 1941 Brigham Young University, PhD 1951 Stanford University.

**BOWDEN, JOAN C.** (1960) Asst. Prof., Edith Bowen Laboratory School. BS 1942, MEd 1964 Utah State University.

**BOWMAN, JAMES T.** (1965) Asst. Prof. of Zoology. BS 1961 Duke University, PhD 1965 University of California.

**BOYCE, PAUL RICHARD** (1966) Instr. in Health, Physical Education and Recreation, Extension Specialist. BS 1961, MRED 1966 Brigham Young University.

**BOYER, FAY W.** (1955) Asso. Prof., Extension Services; Extension Agent. BS 1950, MS 1960 Utah State University.

**BOYLE, WILLIAM S.** (1945) Prof. of Botany. BS 1937 Brigham Young University, MS 1939, PhD 1943 University of California.

**BRANDT, LEROY C., Jr.** (1962) Asst. Prof. of Theatre Arts (Technical Director). AA 1955, BFA 1957, MFA 1958 Boston University.

**BREWER, COURTNEY H.** (1960) Rural Civil Defense Leader and Safety Specialist, Extension Services. BA 1949 Brigham Young University, MS 1953 Utah State University.

**BRINDLEY, WILLIAM A.** (1965) Asst. Prof. of Entomology. BS 1960, MS 1963 Iowa State University.

**BRINGHURST, ANTONE H.** (1966) Asst. Prof. of Mathematics. BS 1963, MS 1965 Utah State University.

**BRISCOE, RALPH D.** (1961) Res. Physicist, Electro-Dynamics Lab. BS 1957, MS 1967 Utah State University.

**BROADBENT, DEE A.** (1938) Vice President of Business Affairs; Prof. of Agricultural Economics. BS 1936 Utah State University, MS 1938 University of Illinois.

**BROADBENT, MARDEN** (1938) Prof., Extension Services; District Director—Provo. BS 1937 Utah State University, MS 1951 University of Illinois, PhD 1960 University of Wisconsin.

**\*BROWER, STEPHEN L.** (1950) Prof., Extension Services; Training and Evaluation. BS 1949, MS 1950 Utah State University, PhD 1961 Cornell University.

**BROWN, DALE** (1966) Freshman Basketball and Head Tennis Coach. BS 1957 Minot State College, MS 1964 University of Oregon.

\*On leave.



**BROWN, FON R.** (1959) Proj. Res. Engineer, Electro-Dynamics Lab. BS 1955, MS 1962 Utah State University.

**BROWN, WILLIAM L.** (1961) Res. Mathematician, Electro-dynamics Lab. BS 1965 Utah State University.

**BUCK, RULON W.** (1949) Asst. Prof., Extension Services; Asst. Coordinator-Instructor, Rural Civil Defense. BS 1948, MS 1953 Utah State University.

**BUDGE, VERN JENSEN** (1967) Instr. in Landscape Architecture and Environmental Planning. BS 1965 Utah State University.

**BUEHLER, VERNON M.** (1968) Prof. of Business Administration. BS 1941 Utah State University, MBA 1948 Harvard University, PhD 1964 George Washington University.

**BULLER, PATRICK E.** (1963) Res. Engineer in Utah Water Research Lab. BSEE 1964 Utah State University.

**BURGOYNE, R. H., CAPT.** (1967) Asst. Prof. of Aerospace Studies. BS 1958 University of Southern California.

**BURNETT, NOLAN K.** (1958) Asst. Prof. of Health, Physical Education and Recreation. BS 1950, MS 1958 Utah State University.

**BURNINGHAM, MELVIN S.** (1945) Asso. Prof., Extension Services; Extension Agent. BS 1937, MS 1966 Utah State University.

**BURTENSHAW, CLAUDE J.** (1962) Dean of Students, Prof. of Political Science. BS 1947, MS 1948, PhD 1955 University of Utah.

**BURTENSHAW, G. RAY** (1944) Asso. Prof., Extension Services; Extension Agent. BS 1940 Utah State University, MEd 1963 Colorado State University.

**BURTON, WARREN L.** (1965) Asst. Prof. of Music, Chairman, Elementary Education. BS 1962, MA 1965 Utah State University.

**BUTCHER, JOHN E.** (1955) Prof. of Animal Science. BS 1950, MS 1952 Montana State College, PhD 1956 Utah State University.

**BYLUND, H. BRUCE** (1964) Asso. Prof. of Sociology. BS 1950, MS 1951 Brigham Young University, PhD 1954 Pennsylvania State University.

**CALDWELL, MARTYN M.** (1967) Asst. Prof. of Range Science. BS 1963 Colorado State University, PhD 1967 Duke University.

**CALL, JAY W.** (1958) Asso. Prof. of Veterinary Science. BS 1952 Utah State University, DVM 1956 Colorado State University.

**CALL, W. VOSCO** (1955) Asso. Prof. of Theatre Arts. BS 1951 Utah State University, MA 1958 University of Washington.

**CAMPBELL, WILLIAM FRANK** (1968) Asso. Prof. of Agronomy. BS 1956, MS 1957 University of Illinois, PhD 1964 Michigan State University.

**CANNON, LAWRENCE O.** (1961) Asst. Prof. of Mathematics. BS 1958 Utah State University, MS 1959 University of Wisconsin, PhD 1965 University of Utah.

**CANNON, MELVIN C.** (1946) Prof. and Head, Dept. of Chemistry. BS 1933, MS 1938 University of Utah, PhD 1941 Boston University.

**CANNON, NORMAN S.** (1947) Head and Prof., Dept. of Accounting. BS 1938 University of Utah, MS 1939, PhD 1957 Columbia University, CPA 1950 State of Utah.

**CANNON, ORSON S.** (1948) Head and Prof., Dept. of Botany. BS 1935, MS 1937 Utah State University, PhD 1943 Cornell University.

**\*CANNON, WILFORD G.** (1965) Asst. Prof. of Accounting. BS 1959 Brigham Young University, MBA 1960 Washington State University.

**CARIGAN, WILLIAM E.** (1965) Asst. Prof. of English. BS 1957 Utah State University, MA 1964 George Washington University.

**CARLISLE, HOWARD MYRON** (1963) Asso. Prof. and Acting Head of Business Administration. BS 1950 Utah State University, MS 1952 University of Wisconsin.

**CARLISLE, JOHN C.** (1937) Dean, College of Education; Prof. of Education. BS 1925 University of Utah, MA 1935, EdD 1938 University of California.

**CARTER, DON C.** (1948) Prof. and Head, Dept. of Family and Child Development. BS 1940 University of Utah, MSW 1947 University of Southern California, EdD 1955 Columbia University.

**CARTER, PAUL B.** (1956) Asso. Prof. of Bacteriology and Public Health. BS 1948, MS 1950, PhD 1955 University of Utah.

**CARTER, WINFRED O.** (1961) Asso. Prof. of Civil Engineering. BS 1953 University of Maryland, MS 1959, PhD 1964 Stanford University.

**CASTO, GLENDON W.** (1962) Asso. Prof. of Psychology. BS 1950, MS 1960 Utah State University, PhD 1966 University of Utah.

**\*CAZIER, STANFORD O.** (1960) Asso. Prof. of History. BS 1952, MA 1956 University of Utah, PhD 1964 University of Wisconsin.

**CHADWICK, DUANE G.** (1957) Asso. Prof., Utah Water Research Lab. BSEE 1952 Utah State University, MSEE 1957 University of Washington.

\*On leave

## 428 *University Faculty*

**CHANNER, HAROLD H.** (1966) Instr. in Geography. BA 1959, MA 1961 Wayne State University.

**CHAPMAN, KEITH J.** (1963) Asst. Prof., Extension Services; Sevier, Wayne-Piute Area Organization Extension Agent. BS 1956 Utah State University.

**CHAPPELL, DICK L.** (1962) Dir. and Asst. Prof., Computer Center. BS 1961 Utah State University, MSLS 1962 University of Washington.

**CHASE, DARYL** (1945) President; Professor. BA 1927 University of Utah, MA 1931, PhD 1936 University of Chicago.

**CHASE, LUCILE** (1967) Instr. in Health, Physical Education and Recreation. BS 1965, MS 1967 Utah State University.

**CHATELAIN, JACK E.** (1957) Asso. Prof. of Physics. BS 1947, MS 1948 Utah State University, PhD 1957 Lehigh University.

**CHECKETTS, KEITH T.** (1965) Asst. Prof. and Couns., Counseling and Testing. BS 1959 Utah State University, PhD 1965 University of Minnesota.

**CHILD, RAWSON D.** (1948) Asso. Prof. of Manufacturing Engineering. BS 1949, MS 1953 Utah State University.

**CHRISTENSEN, PAUL D.** (1954) Prof. of Soils and Meteorology; Soil Conservationist, Extension Services. BS 1937 Brigham Young University, MS 1948 Utah State University, PhD 1950 Rutgers University.

**CHRISTENSEN, RONDO A.** (1957) Asso. Prof. of Agricultural Economics. BS 1954 Utah State University, MS 1955, PhD 1957 Cornell University.

**CHRISTENSEN, VAL R.** (1965) Coordinator of Student Activities and Director of Student Union Building. BS 1960, MS 1964 Utah State University.

**CHRISTIANSEN, DEL RAE** (1963) Asst. Prof. of English. BS 1937 Brigham Young University, BA 1949, MA 1949 University of Utah, PhD 1951 University of Manchester, England.

**CHRISTIANSEN, JERALD E.** (1946) Prof., Utah Water Research Lab. BS 1927, AE 1927 Utah State University, MS 1928, CE 1935 University of California.

**CHRISTIANSEN, VANCE T.** (1960) Asst. Prof. of Civil Engineering. BS 1959, MS 1960 University of Wyoming.

**CLARK, C. ELMER** (1952) Asso. Prof. of Animal Science; Poultry Specialist, Extension Services. BS 1950 Utah State University, MS 1960, PhD 1962 University of Maryland.

**CLARK, CLAYTON** (1937) Director, Engineering Experiment Station; Prof. of Electrical Engineering. BS 1933 Utah State University, EE 1947, PhD 1957 Stanford University.

**CLARK, MICHAEL J.** (1967) Instr. and Adm. Asst. to Librarian. BS 1966 Utah State University.

**CLARK, RALPH T.** (1963) Asst. Prof. of Art. BS 1950 Utah State University, BPA 1958 Art Center School.

**CLARK, THOMAS C.** (1966) Instr. in Audiology-Speech Pathology. BS 1956 Brigham Young University, MS 1959 Gallaudet College.

**CLARKSON, DALE** (1966) Instr., Area Extension Agent, Five-County Area. BS 1956 Arizona State University.

**CLAYTON, RUTH V.** (1962) Instr. in Clothing and Textiles. BS 1947, MS 1953 Utah State University.

**CLEMENT, LLOYD A.** (1951) Asso. Prof. of Agricultural Economics; Economist, Extension Services. BS 1954 Utah State University, MAP 1959 Harvard University.

**CLINE, JAMES E.** (1965) Asst. Prof. of Physics; Federal Collaborator. BS 1953, MS 1954, PhD 1958 University of Michigan.

**CLYDE, CALVIN G.** (1963) Prof. and Assistant Director, Utah Water Research Lab. BS 1951 University of Utah, MS 1952, CE 1953, PhD 1961 University of California.

**COATES, RUTH D.** (1946) Asso. Prof., Extension Services; Extension Agent. BS 1943, MS 1964 Utah State University.

**COCHRAN, GEORGE W.** (1948) Prof. of Botany. BS 1941, MS 1942 Kansas State College, PhD 1946 Cornell University.

**COLE, LARRY S.** (1939) Asst. Dean, College of Engineering; Prof. and Head, Dept. of Electrical Engineering. BS 1940 University of Utah, MS 1945 Utah State University, DEng 1950 Stanford University.

**\*COLLIER, ROBERT P.** (1958) Dean, College of Business and Social Sciences; Prof. of Business Administration. BA 1942 Reed College, PhD 1955 Stanford University.

**COLTHARP, GEORGE BERNARD** (1964) Asst. Prof. of Range Science. BS 1951 Louisiana State University, MS 1955 Colorado State University, PhD 1958 Michigan State University.

**COMPTON, NORMA H.** (1963) Prof. and Head, Dept. of Clothing and Textiles. AB 1950 George Washington University, MS 1957, PhD 1962 University of Maryland.

**COMPTON, WILLIAM R.** (1965) Prof. of Sociology. LLB 1928 Albany Law School, MBA 1931 Harvard, JSD 1933 Cornell University.

\*On leave

**COOK, C. WAYNE** (1946) Asst. to Dean, College of Natural Resources; Prof. of Range Science. BS 1940 Kansas State College, MS 1942 Utah State University, PhD 1950 Texas A & M University.

**CORDON, WILLIAM A.** (1956) Prof. of Civil Engineering. BS 1935, MS 1962 Utah State University.

**COX, LOIS** (1961) Technical Writer, Research. BS 1954 University of California.

**CRAGUN, JOHN R.** (1965) Asst. Prof. of Business and Psychology. BS 1959, MS 1961 Utah State University, PhD 1966 Purdue University.

**CRAIG, CLIFFORD BEAN** (1967) Instr. in Geography. BS 1963 College of Southern Utah, MA 1967 Ohio State University.

**CREHAN, DEBORAH S.** (1966) Instr. in English. AB 1964 Middlebury College, MA 1965 University of Wyoming.

**CROCKETT, ZENNA BETH** (1960) Asst. Prof. of English. BS 1949, MS 1960 Utah State University.

**CROSLAND, BETH ANN NIXON** (1963) Instr. in Extension Services; Extension Agent. Graduate of College of Southern Utah, BS 1942 Brigham Young University.

**CROWE, THOMAS D.** (1966) Asso. Prof.; Federal Collaborator. BS 1966 Auburn University.

**CRUMBO, WILTA MAE** (1967) Instr. in Extension Services; Extension Agent. BS 1944 University of Southwestern Louisiana.

**CULMSEE, CARLTON F.** (1945) Dean, College of Humanities and Arts; Prof. of American Civilization. BS 1932, MA 1937 Brigham Young University, PhD 1940 State University of Iowa.

**DAINES, DAVID R.** (1967) Asst. Prof. of Business Administration. BS 1953 Utah State University, LLB 1955 University of Utah.

**\*DAINES, SPENCER H.** (1943) Asso. Dean, College of Engineering; Asso. Prof. of Civil Engineering. BS 1942 Utah State University, MS 1950 Kansas State University.

**DALBY, MAX F.** (1957) Prof. and Head, Department of Music; Director of Bands. AB 1942 Brigham Young University, MA 1950 San Diego State College, EdD 1961 Utah State University.

**DALEY, MARVIN F.** (1965) Asst. Prof. of Psychology. BS 1956, MS 1958 University of New Mexico, PhD 1962 University of Houston.

**DANIEL, T. W.** (1944) Prof. of Forest Science. BS 1934, MS 1936, PhD 1942 University of California.

**DANIELS, PAUL R.** (1953) Asso. Prof., Extension Services; Extension Agent. BS 1948 Utah State University, MED 1964 Colorado State University.

**DANSIE, BYRON ROBERT** (1967) Instructor in Industrial and Technical Education. BS 1966 Utah State University.

**DARLEY, ELIZABETH** (1954) Asso. Prof., Extension Services; Extension Agent. BS 1935 Utah State University, MED 1964 Colorado State University.

**DASH, EDWARD FRANK** (1967) Couns., Student Services. BA 1958, MA 1962 University of California.

**DAVIS, DONALD W.** (1954) Prof. of Entomology. BS 1941, PhD 1950 University of California.

**DAVIS, LYNN H.** (1950) Prof. of Agricultural Economics. BS 1949, MS 1953 Utah State University, PhD 1961 Oregon State University.

**DAVIS, ROBERT** (1961) Res. Asso., Veterinary Science. BS 1954 Brigham Young University.

**DAY, WILFORD LAVON** (1964) Asst. Prof. of Extension Services; Extension Agent. BS 1964 Utah State University.

**DAYTON, JANEL MUNK** (1966) Instr. in Food and Nutrition. BS 1962 Brigham Young University, MS 1964 Iowa State University.

**DEGENER, CARL T.** (1965) Asso. Prof. of Languages. BS 1927 Brunswick, MA, PhD 1930 Goettingen University, Germany.

**DEHART, WILLIAM A.** (1951) Asso. Prof. of Sociology. BS 1937 Brigham Young University, MA 1941 University of Minnesota, PhD 1950 University of Wisconsin.

**DENNEY, ALICE** (1960) Res. Asso. in Plant Science. BA 1951, MA 1955 University of Utah, PhD 1963 Utah State University.

**DERBYSHIRE, MAURICE** (1967) Asst. Prof. of Elementary Education. BS 1945, MS 1955 University of Utah.

**DESPAIN, ALVIN M.** (1966) Asst. Prof. and Asst. Director of Electro-Dynamics Lab. BS 1960, MS 1964, PhD 1966 University of Utah.

**DEWEY, WADE G.** (1956) Prof. of Agronomy. BS 1953 Utah State University, PhD 1956 Cornell University.

**DITTMER, A. L.** (1956) Prof. of Music; Chairman, Theory and Composition. AB 1936 University of Utah, MA 1938 Teachers College, Columbia University, PhD 1950 Eastman School of Music, University of Rochester.

\*On leave

## 430 *University Faculty*

**DIXON, KEITH L.** (1959) Prof. of Zoology. AB 1943 San Diego State College, MA 1948, PhD 1953 University of California.

**DOBSON, DONALD C.** (1957) Asst. Prof. of Animal Science. BS 1954 Utah State University, MS 1955 Cornell University, PhD 1961 Utah State University.

**DOLAN, CHARLES P.** (1967) Senior Research Technician.

**DONIGAN, ROBERT W.** (1967) Producer-Director, Radio-TV. BS 1954 Northwestern University, MS 1964 Brigham Young University.

**DOTSON, ALLENE D.** (1967) Instr. in English. AB 1961 University of Kentucky, MA 1963 University of Arkansas.

**DOWNS, LOIS** (1949) Asso. Prof. of Health, Physical Education and Recreation. BS 1945, MS 1949 Utah State University.

**DRAGE, DIXIE** (1967) Instr. in Library Science and Head Cataloger. BA 1964 Utah State University.

**DRAKE, ELDON M.** (1951) Prof. of Education. BS 1943 Utah State University, MS 1949, PhD 1951 Iowa State College.

**DRAPER, C. I.** (1945) Prof. of Animal Science; Extension Agent. BS 1939 Utah State University, PhD 1953 Iowa State College.

**DRAPER, RULON** (1954) Res. Asso., Plant Science. BS 1949 Utah State University.

**DRURY, LLOYD A.** (1962) Asso. Director and Prof. of Extension Services. BA 1947 Southern Idaho College of Education, MA 1948 Colorado State University, EdD 1952 University of Wyoming.

**DUNMIRE, IRVIN D.** (1963) Asst. Prof. of Electrical Engineering. BSGE 1953, BSEE 1961, MS 1963 University of Wyoming.

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**LITTLEDIKE, LILA JACLYN** (1966) Clinical Supervisor in Audiology-Speech Pathology. BA 1965, MS 1966 Utah State University.

**LOGAN, IDA-MARIE** (1947) Asso. Prof. of Library Science. BS 1938, MS 1956 Utah State University, MALS 1960 University of Denver.

**LONG, RALPH E.** (1967) Asst. Prof. of Industrial and Technical Education. BA 1955 State College of Iowa, MEd 1966 Colorado State University.

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- ROBERTS, NORMAN KEITH** (1957) Prof. and Head, Dept. of Agricultural Economics, Director Economics Research Institute. BS 1948, MS 1949 Iowa State College, PhD 1958 University of Kentucky.
- ROBERTS, REED S.** (1960) Asst. Prof. of Zoology; Extension Entomologist. BS 1942, MS 1948 Utah State University.
- ROBERTSON, ARCHIE V., SFC** (1961) US Army; Asst. Instr. in Military Science.
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- ROBERTSON, VON H.** (1963) Asst. Prof. of Industrial and Technical Education; State Coordinator of Technical Education. BS 1931 Utah State University.
- ROBINSON, REX E.** (1946) Prof. and Head, Dept. of Speech. BS 1931 Oregon State University, MS 1933 State University of Iowa, PhD 1946 University of Wisconsin.
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- ROMIG, RALPH** (1966) Food Service Director.
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**SMITH, HUBERT W.** (1947) Prof. of English. AB 1928 Park College, MS 1933 Northwestern University, PhD 1949 University of Pennsylvania.

**SMITH, KATHRYN S.** (1960) Asst. Prof., Education, Edith Bowen Laboratory School. BS 1948, MEd 1965 Utah State University.

**SMITH, LARRY GENE** (1965) Asst. Prof., Music; Asst. Director of University Bands. BS 1959, MM 1966 Utah State University.

**SMITH, LARRY R.** (1962) Res. Engineer, Electro-Dynamics Lab. BS 1967 Utah State University.

**SMITH, R. L.** (1955) Prof. of Soils and Meteorology. BS 1951, MS 1952 Utah State University, PhD 1955 University of California (LA).

**SMITH, RONALD W.** (1965) Instr. in English. BA 1963 Hunter College (University of New York), MA 1965 University of Wyoming.

**SMITH, VEARL R.** (1963) Dean, College of Agriculture; Prof. of Dairy Science. BS 1939 University of Idaho, MS 1941 Oregon State University, PhD 1944 University of Minnesota.

**SMITH, WENDELL W.** (1965) Instr. in Languages. BS 1952 Utah State University, MA 1959 Harvard University.

**SMITH, WILLIAM LLOYD** (1954) Asso. Prof., Extension Services; Extension Agent. BS 1954 Ricks College, MS 1955 Utah State University.

**SMITH, WINSLOW WHITNEY** (1946) Prof. of Bacteriology and Public Health. BA 1933, MA 1936 University of Utah, PhD 1939 University of Wisconsin.

**SNOW, PHYLLIS** (1961) Dean, College of Family Life. BS 1934 University of Utah, MS 1953, PhD 1956 Cornell University.

**SOMERS, W. KARL** (1946) Asso. Prof. of Manufacturing Engineering. BS 1948, MS 1960 Utah State University. Technical courses at California Institute of Technology and University of California.

**SORENSEN, JOHN MARK** (1960) Instr. in Library Science. BS 1956, MS 1961 Utah State University.

**SORENSEN, ROBERTA** (1963) Instr. in English. BS 1960, MA 1963 Utah State University.

**SORENSEN, EVAN J.** (1955) Supervisor of the Division of General Registration and Instr. in Student Services. BS 1947, MS 1954 Utah State University.

**SOUTHARD, ALVIN R.** (1967) Asso. Prof. of Soils and Meteorology. BS 1957, MS 1958 Utah State University, PhD 1963 Cornell University.

**SPEAR, CARL D.** (1966) Asso. Prof. and Head, Dept. of Manufacturing Engineering. BS 1955, PhD 1960 University of Utah.

**SPENCE, JACK T.** (1958) Asso. Prof. of Chemistry. BS 1951, PhD 1957 University of Utah.

**SPENCER, BERKLEY A.** (1967) Asst. Prof. of Sociology. BA 1960, MA 1962 Brigham Young University, PhD 1967 Cornell University.

**SPENDLOVE, REX S.** (1966) Head and Prof., Dept. of Bacteriology and Public Health. BS 1950, MS 1952 Brigham Young University, PhD 1955 Ohio State University.

**SPILLETT, JAMES JUAN** (1967) Asst. Prof. of Wildlife Resources, Federal Collaborator. BS 1961, MS 1964 Utah State University, ScD 1968 Johns Hopkins University.

**SPOERRY, PHILLIP S.** (1961) Asso. Prof. of Political Science. BA 1949, MA 1952 University of Washington, PhD 1967 Harvard University.

**STALNAKER, CLAIR B.** (1966) Asst. Prof. of Wildlife Resources, Federal Collaborator. BSF 1960 West Virginia University, PhD 1966 North Carolina State University.

**STANLEY, HUGH P.** (1966) Asst. Prof. of Zoology. BA 1951 University of California, MA 1958, PhD 1961 Oregon State University.

**STARK, ARVIL** (1963) Prof., Extension Services; Horticulture and Landscape Specialist. BS 1929 Utah State University, MS 1932, PhD 1934 Iowa State College.

**STEED, ALLAN JOSEPH** (1964) Proj. Res. Engineer in Electro-Dynamics Lab. BS 1963, MS 1964 Utah State University.

**STEFFEN, HYRUM** (1937) Asso. Prof. of Animal Science. BS 1937 Utah State University, MS 1950 University of Illinois.

**STENQUIST, LEE B.** (1954) Director of Budgets and Internal Audits; Asst. Prof. of Business Administration. BS 1947 Brigham Young University, MBA 1963 University of Utah.

**\*STENQUIST, NORRIS J.** (1958) Asst. Prof., Extension Services; Extension Agent. BS 1957, MS 1958 Utah State University.

**STEVENSON, EVAN N.** (1955) Director of Auxiliary and Service Enterprises. BS 1951 Brigham Young University, MS 1967 Utah State University.

**STEWART, J. J.** (1947) University Editor; Prof. of English and Journalism. BS 1949 Utah State University, MS 1957 University of Oregon.

**STOCK, REED C.** (1959) Asso. Prof. of English. BS 1950 Utah State University, MA 1958 Rutgers University.

**STODDARD, GEORGE E.** (1952) Prof. and Head, Dept. of Dairy Science. BS 1943 University of Idaho, MS 1948, PhD 1950 University of Wisconsin.

**STODDARD, TED D.** (1966) Asst. Prof. of Business Education and Business Administration. BS 1962, MS 1963 Brigham Young University, EdD 1967 Arizona State University.

**STODDARD, L. A.** (1935) Prof. and Head, Dept. of Range Science. BS 1931, MS 1932 Colorado State University, PhD 1934 University of Nebraska.

**STOKER, GOLDEN L.** (1945) Asso. Prof. of Agronomy. BS 1932, MS 1933 Utah State University.

**STOKES, ALLEN W.** (1952) Prof. of Wildlife Resources. BS 1936 Raverford College, MA 1942 Harvard University, PhD 1952 University of Wisconsin.

\*On leave

**STOKES, L. DARRELL** (1941) Asso. Prof., Extension Services; Extension Agent. BS 1938 Utah State University.

**STONE, DAVID R.** (1946) Prof. of Psychology. BA 1943, MA 1943 University of Utah, PhD 1946 University of Chicago.

**STREET, JOSEPH C.** (1956) Prof. of Animal Science. BS 1950, MS 1952 Montana State University, PhD 1954 Oklahoma State University.

**STRINGHAM, GLEN E.** (1965) Asst. to the Dean, Asso. Prof., Utah Water Research Lab. BS 1955 Utah State University, PhD 1966 Colorado State University.

**SUDWEEKS, CARMEN MARY** (1966) Instr., Extension Services; Extension Agent. BS 1964 Arizona State College.

**SUDWEEKS, EARL MAN** (1962) Asst. Prof., Extension Services; Extension Agent. BS 1960, MS 1962 Utah State University.

**SUMMERHAYS, DIANA** (1966) Instr. in English and Journalism. BA 1965 University of Utah, MA 1966 Columbia University.

**SUMMERS, LOWELL P.** (1946) Asso. Prof. of Industrial and Technical Education. BS 1940, MS 1956 Utah State University.

**SUPRUNOWICZ, KONRAD** (1961) Asso. Prof. of Mathematics. BS 1952, MA 1953, PhD 1960 University of Nebraska.

**SUPRUNOWICZ, VALENTINE** (1961) Asst. Prof. of Languages. Cand. Phil. 1951 Christian Aralbrecht University in Kiel, MA 1955 University of Nebraska.

**SWENSON, DAN H.** (1948) Asst. Prof. of Mechanical Engineering. BS 1940, MS 1949 Utah State University.

**TAGGART, GLEN L.** (1968) President; Prof. of Sociology. BS 1940 Utah State University, PhD 1946 University of Wisconsin.

**\*TANNER, HELEN J.** (1960) Instr. in Education, Edith Bowen Laboratory School. BS 1949 University of Utah, MS 1963 Utah State University.

**TAYLOR, BURTON** (1964) Prof. and Head, Dept. of Landscape Architecture and Environmental Planning. BS 1948 Utah State University, MLA 1951 Harvard University Graduate School of Design, SPL Study Massachusetts Institute of Technology, 1949-50 Cambridge School of Design.

**TAYLOR, FRANCES G.** (1967) Instr. in Food and Nutrition. BS 1941 Utah State University.

**TAYLOR, LAWRENCE C.** (1967) Asst. Prof. of Business Administration and Campus Coordinator of RITA Project. BS 1948, MS 1949 Utah State University.

**TAYLOR, MORRIS H.** (1945) Prof. of Agricultural Economics; Livestock Marketing Specialist, Extension Services. BS 1937 Utah State University, MS 1940, PhD 1958 University of Wisconsin.

**TAYLOR, RICHARD D.** (1964) Asso. Prof. of Audiology-Speech Pathology. BS 1955, MS 1956 University of Utah, PhD 1961 Wayne State University.

**TAYLOR, ROLAND H., LT. COL.** (1965) US Air Force; Prof. of Aerospace Studies. BA 1949, MA 1951 University of California (LA).

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**THATCHER, RAY A.** (1944) Technician; Soils and Crops, Asso. Prof., Extension Services; Extension Agent. BS 1942 Utah State University, MS 1958 University of California.

**THAYER, ARNOLD A.** (1965) Research Journalist, Electro-Dynamics Lab. BS 1958 Utah State University.

**THOMAS, DON W.** (1954) Asso. Prof. of Veterinary Science; Veterinarian, Extension Services. BS 1949 Utah State University, DVM 1953 Iowa State College.

**THOMAS, H. PRESTON** (1965) Asst. Prof. of Political Science. BS 1954 Utah State University, LLB 1957 Harvard University.

**THOMAS, JAMES ALAN** (1952) Asst. Prof. of Veterinary Science. DVM 1946 Colorado State University.

**THOMSON, IRENE GIDDINGS** (1963) Asst. Prof., Extension Services; Extension Agent. BS 1940, MS 1963 Brigham Young University.

**THORNE, ALISON C.** (1964) Lecturer, Family and Child Development and Sociology. BS 1934 Brigham Young University, MS 1935, PhD 1938 Iowa State University.

**THORNE, D. WYNNE** (1939) Vice President of University Research; Prof. of Soils and Meteorology. BS 1933 Utah State University, MS 1934, PhD 1936 Iowa State University.

**THORDESON, JOHN RICHARD** (1968) Coordinator of High School Relations. BS 1960 University of Utah.

**THORNLEY, GWENDELLA** (1947) Asso. Prof. of Speech. BS 1940, MS 1947 Utah State University.

**THORPE, EVERETT C.** (1936) Prof. of Art. BS 1940 Utah State University, MFA 1950 University of Utah.

\*On leave.

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**TINGEY, WILLIS A.** (1946) Asst. Prof. of Civil and Irrigation Engineering. BS 1928 Utah State University.

**TIPPETTS, RUTH PARRISH** (1944) Asso. Prof., Extension Services; Extension Agent. BS 1931 Utah State University.

**TIPPETTS, TWAIN C.** (1956) Prof. and Acting Head, Dept. of Theatre Arts; Coordinator of Fine Arts. BS 1939, MA 1941 Brigham Young University, EdD 1960 University of California (LA).

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**UNDERWOOD, ERNEST EUGENE** (1961) Asst. Prof. of Mathematics. BA 1957 Montana State University, MA 1961 University of Illinois.

**VALENTINE, KRISTIN** (1965) Instr. in Speech. BS 1955, MS 1963 University of Wisconsin.

**\*VAN EPPS, GORDON A.** (1952) Asso. Prof. of Agronomy. BS 1942, MS 1948 Utah State University.

**VANUS, EARL E., T/SGT** (1966) U.S. Air Force. Sergeant Major in Aerospace Studies.

**VAN ORDEN, HARRIS O.** (1946) Prof. of Chemistry. BS 1938 Utah State University, MS 1942 State College of Washington, PhD 1951 Massachusetts Institute of Technology.

**VAN SUCHTELEN ADRIAN** (1965) Instr. in Art. Diploma El Camino Jr. College, MA 1966 Otis Art Institute of Los Angeles.

**VENDELL, EDWARD W., JR.** (1960) Asso. Prof. of Mechanical Engineering. BS 1955, MS 1960 University of Utah, PhD 1967 Oklahoma State University.

**VIEWHUEG, STEVEN HERMAN** (1967) Asst. Prof. and Project Coordinator of Audiology-Speech Pathology. BS 1963, MS 1965 Utah State University, PhD 1967 Northwestern University.

**VON DASSOW, JOHN R.** (1966) Instr. in Languages and Philosophy. BA 1961, MA 1966 University of Washington.

**VON NIEDERHAUSERN, FRED R.** (1963) Lecturer in Landscape Architecture and Environmental Planning. BFA 1954 University of Utah.

**WADSWORTH, HAROLD M.** (1946) Superintendent of Plant Operations and Maintenance. BS 1927 Utah State University.

**WAGAR, J. ALAN** (1962) Asso. Prof. of Wildlife Resources; Federal Collaborator. BSF 1952 University of Washington, MF 1956, PhD 1961 University of Michigan.

**WAGNER, FREDERIC H.** (1961) Prof. of Wildlife Resources. BS 1949 Southern Methodist University, MS 1953, PhD 1961 University of Wisconsin.

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**WAMSLEY, HELEN J.** (1946) Asst. Prof., Extension Services; Extension Agent. BS 1937 Utah State University.

**WANGSGARD, LYNNE** (1967) Instr. in English. BA 1966 Carleton College, MA 1967 University of Minnesota.

**WARDLE, ALVIN** (1959) Asst. Prof. of Music; Asso. Director of University Bands. BA 1951 Brigham Young University, MED 1955 Utah State University.

**WASSERMANN, IRVING** (1955) Prof. of Music; Pianist Artist-in-Residence. ML 1937 University of Cracov, Poland.

**WATKINS, BRUCE O.** (1953) Prof. of Electrical Engineering. BSEE 1934, EE 1947 University of Arizona, MSEE 1947 University of Missouri, PhD 1954 University of Minnesota.

**WATKINS, REYNOLD K.** (1947) Prof. and Head, Dept. of Mechanical Engineering, BS 1944 University of Utah, MS 1947 Massachusetts Institute of Technology, PhD 1957 Iowa State University.

**WATSON, JAMES D.** (1967) Asso. Prof. of Civil Engineering. BA 1954 Bemidji State College, MA 1960 University of Minnesota, PhD 1967 Iowa State University.

**WATTERS, GARY Z.** (1963) Asso. Prof., Utah Water Research Lab. BS 1957 Chicago State College, MS 1958, PhD 1963 Stanford University.

**WELKIE, GEORGE W.** (1957) Asso. Prof. of Botany. BS 1952, MS 1954 Pennsylvania State University, PhD University of Wisconsin.

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**\*WENNERGREN, E. BOYD** (1959) Prof. of Agricultural Economics. BS 1951, MS 1956 Utah State University, PhD 1959 Pennsylvania State University.

**WEST, NEIL E.** (1964) Asst. Prof. of Range Science. BS 1960, PhD 1964 Oregon State University.

**WESTBY, CARL A.** (1967) Asst. Prof. of Bacteriology and Public Health. BA 1958 University of California (Riverside), PhD University of California (Davis).

**WHALEY, ROSS S.** (1964) Dept. Head and Asso. Prof. of Forest Science. BS 1959 University of Michigan, MS 1961 Colorado State University.

**WHEELER, NED BRENT** (1967) Project Research Engineer, Electro-Dynamics Lab. BSEE 1964, MSEE 1965 Utah State University.

**WHEELER, RUTH E.** (1966) Asst. Prof. of Food and Nutrition. BS 1964, MS 1966 University of Washington.

**WHITE, CHARLES COLVEN** (1963) Instr. in Mathematics. BS 1958, MEd 1964 Utah State University.

**WHITE, DAVID** (1965) Asst. Prof. and Statistical Consultant, Dept. of Applied Statistics and Computer Science. BA 1951, MA 1957 Brigham Young University, PhD 1964 Oklahoma State University.

**WIEBE, HERMAN H.** (1954) Prof. of Botany. BA 1947 Goshen College, MS 1949 University of Iowa, PhD 1953 Duke University.

**\*WIGGINS, EVELYN L.** (1956) Asst. Prof. of Elementary Education. BS 1947, MS 1959 Utah State University.

**WILCOX, ETHELWYN B.** (1943) Prof. and Head, Dept. of Food and Nutrition. BS 1931, MS 1937, PhD 1942 Iowa State College.

**WILDE, GLENN** (1966) Instr. in English. BS 1965 Weber State College, MA 1966 Utah State University.

**WILDE, MILLARD E.** (1965) Editor, Agricultural Experiment Station. BS 1961 Brigham Young University.

**WILKIE, THOMAS W., MAJOR** (1966) US Army; Asst. Prof. of Military Science. BS 1954 Indiana University.

**WILKINSON, JULIAN** (1966) Instr. and Systems Specialist in Applied Statistics and Computer Science. BS 1961, MS 1966 Utah State University.

**WILLEY, LYNN R.** (1946) Asso. Prof. of Industrial and Technical Education. Trade certificate 1939, BS 1950, MS 1953 Utah State University.

**WILLIAMS, FRANK R.** (1964) Director of Athletics. BS 1948, MS 1956 Utah State University.

**WILLIAMS, JOHN R.** (1961) Asst. to Dean of Students; Asst. Prof. of Education. BS 1947, MS 1948 Brigham Young University.

**WILLIAMSON, DAVID O.** (1946) Res. Asso., Animal Science. BS 1936 Utah State University.

**WILLIE, JOHN C.** (1966) Instr., Extension Services; Area Extension Agent, Community Planning and Zoning. BS 1962 Utah State University.

**WOFFINDEN, DUARD S.** (1961) Res. Engineer, Utah Water Research Lab. and Electro-Dynamics Lab. BS 1948, MS 1965 Utah State University.

**WOOD, JERRY LEE** (1965) Asst. Prof. of Business Education and Office Administration. BS 1958, MEd 1962 Oregon State University.

**WOOD, JOHN K.** (1956) Prof. of Physics. BS 1941 Utah State University, MS 1942, PhD 1946 Pennsylvania State University.

**\*WOOD, RULON KENT** (1962) Asst. Prof. of Library Science. BS 1959 University of Utah, MA 1961 University of Denver.

**WORKMAN, GAR W.** (1966) Asst. Prof. of Wildlife Research and Extension Specialist. BS 1957, MS 1959, PhD 1963 Utah State University.

**WRIGHT, E. WAYNE** (1957) Prof. of Psychology. BA 1952, MA 1953 Brigham Young University, EdD 1957 University of California.

**WRIGHT, J. LAMAR** (1964) Asst. Prof. of Industrial and Technical Education. BS 1956, MS 1963 Utah State University.

**WYATT, CLAIR L.** (1959) Project Research Engineer, Electro-Dynamics Lab. BS 1955, MS 1962 Utah State University.

**YOUSEF, NABIL N.** (1964) Res. Asso. in Zoology. BS 1958 AIN-Sham University, MS 1964, PhD 1966 Utah State University.

## Emeritus Faculty

**Agren, Ellen**  
Emeritus Professor, Extension Services

**Allen, Bert V.**  
Emeritus Professor, Photography

**Baker, H. Cecil, BS**  
Emeritus, Associate Professor, Health,  
Physical Education and Recreation

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## 448 *University Faculty*

- Bateman, George Q., BS**  
Emeritus Professor, Dairy Science
- Bell, William H., BS, MS**  
Emeritus Professor, Business Administration
- \*\*Blanch, George T., BS, MS, PhD**  
Emeritus Professor, Agricultural Economics
- Boswell, Stephen R.**  
Emeritus Professor, Extension Services
- \*\*Brite, J. Duncan, BA, MA, PhD**  
Emeritus Professor, History
- \*\*Budge, Pearl S., BS, MS**  
Emeritus Associate Professor, Education
- Burgoyne, David A., BS, MS**  
Emeritus Professor, Agricultural Experiment Station
- Caine, George B., BS, MA**  
Emeritus Professor, Dairy Science
- \*\*Call, Anson B., Jr., BS, MS**  
Emeritus Associate Professor, Plant Science
- Carter, Pearl J.**  
Emeritus Assistant Professor, Library Science
- Christensen, A. L., BS, MS**  
Emeritus Professor, Extension Services
- Dorst, Howard E., AB, MS, PhD**  
Emeritus Professor, Zoology
- Dyer, Dorothy T., BS, MA**  
Emeritus Dean, College of Family Life
- \*\*Fogelberg, Thelma, BS, MA, PhD**  
Emeritus Professor, Languages
- Frandsen, Arden N., BS, MS, PhD**  
Emeritus Professor, Psychology
- Fredrickson, Carmen Daines, BS, MS**  
Emeritus Associate Professor, Sociology
- \*\*Frischknecht, Carl, BS, MS, PhD**  
Emeritus Professor, Director of Extension Services
- Geddes, Joseph A., AB, AM, PhD**  
Emeritus Professor, Sociology
- Guymon, E. Lee, BS, MS**  
Emeritus Professor, Extension Services
- Hansen, Reuben, BS**  
Emeritus Professor, Extension Services
- Hayward, Ira N., BS, PhM**  
Emeritus Professor, English
- Henderson, George R., BS, MS**  
Emeritus Professor, Extension Services
- \*\*Hendricks, Ira King, BS, MA, PhD**  
Emeritus Professor, English and Journalism
- Huber, Thelma, BS, MS**  
Emeritus Professor, Extension Services
- Humphreys, L. R., BS**  
Emeritus Professor, Agricultural Education
- Hurst, Clyde**  
Emeritus Instructor, Industrial and Technical Education
- Israelsen, Orson W., BS, MS, PhD**  
Emeritus Professor, Irrigation and Drainage Engineering
- \*\*Israelsen, Vernon L., BS, MS, PhD**  
Emeritus Professor, Economics
- Jensen, George C., AB, MA**  
Emeritus Professor, Languages
- Kemp, Antone B.**  
Emeritus Instructor, Industrial and Technical Education
- Knowlton, George F.**  
Emeritus Professor, Entomology
- Lund, Nettie B., BS**  
Emeritus Professor, Extension Services
- Maeser, Sherwin, AB, PhD**  
Emeritus Professor, Chemistry
- \*\*McBride, C. D., BS, MS**  
Emeritus Professor, Business Administration
- Martin, Maud, BS**  
Emeritus Associate Professor, Extension Services
- Merkley, Charles N.**  
Emeritus Associate Professor, Industrial and Technical Education
- Meyer, George A., BA, STB, PhD**  
Emeritus Professor, Languages
- Miller, Elna, BS, MS**  
Emeritus Professor, Extension Services
- Morris, A. J., BS, MS**  
Emeritus Professor, Dairy Science
- Morris, Laval, BS, MS, MLA**  
Emeritus Professor, Landscape Architecture and Environmental Planning
- \*\*Murray, Evan B., BS, MS**  
Emeritus Professor, Economics
- Myers, Chester James, BS, MA, PhD**  
Emeritus Professor, Speech
- Nelson, George**  
Emeritus Instructor, Physical Education
- Nichols, Delore, BS**  
Emeritus Professor, Extension Services
- Noble Le Grande, BS, MS, EdD**  
Emeritus Professor, Education
- Owens, W. W.**  
Emeritus Professor, Director of Extension Services

**\*\*Current staff assignment.**

**Pedersen, N. Alvin, AB, MA, PhD**  
Emeritus Dean, College of Humanities and Arts

**Preator, Frederick, BS, MS**  
Emeritus Professor, Manufacturing Engineering

**\*\*Reynolds, H. Reuben**  
Emeritus Professor, Art

**Richards, B. L., BS, MS, PhD**  
Emeritus Professor, Botany

**\*\*Richardson, Stanley S., BS, MS**  
Emeritus Professor, Agricultural Education

**Ricks, Joel Edward, BA, MA, PhD**  
Emeritus Professor, History

**Robinson, D. E., BS**  
Emeritus Professor, Business Administration

**Rowland, Priscilla, BS, MS**  
Emeritus Assistant Professor, Food and Nutrition

**Sharp, David Jr., BS**  
Emeritus Professor, Extension Services

**Smith, Albert E., BS**  
Emeritus Professor, Extension Services

**Sorenson, C. J., BS, MS**  
Emeritus Professor, Entomology

**Stanford, J. Sedley, BS, PhD**  
Emeritus Professor, Zoology and Entomology

**\*\*Stevens, Kenneth R., BS, MS, PhD**  
Emeritus Professor, Bacteriology and Public Health

**Stevens, Velyn B., BS**  
Emeritus Assistant Professor, Extension Services

**Stewart, Robert H., BS**  
Emeritus Professor, Extension Services

**Swindle, Karma P.**  
Emeritus Associate Professor, Extension Services

**Thain, Aldyth, MA**  
Emeritus Professor, Languages

**Tingey, Delmar C., BS, MS**  
Emeritus Professor, Plant Science

**Tueller, Lamont E., BS**  
Emeritus Associate Professor, Extension Services

**Walti, Walter, BA, MA, MusD**  
Emeritus Professor, Music

**\*\*Williams, J. Stewart, BS, MS, PhD**  
Emeritus Professor, Dean, School of Graduate Studies

**\*\*Wilson, Lemoyne, BS, MS**  
Emeritus Associate Professor, Soils and Meteorology

## Government Collaborators At USU

**Andersen, Jay C., BS, MS, PhD**  
Economic Research Service

**Anderson, Melvin J., BS, MS, PhD**  
Agricultural Research Service

**Beale, Donald M., BS, MS**  
Utah Division Fish and Game

**Beardsley, Wendell G., BS, MS**  
Forest Service

**Binns, Wayne, MS, DVM**  
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**Bleak, Alvin T., BS**  
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**Bohart, George E., BS, MS, PhD**  
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**Bohl, Wayne H., BS, MS**  
U.S. Game and Wildlife Service

**Brown, Raymond W., BS, MS**  
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**Carter, David L., BS, MS, PhD**  
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**Carver, Royal Thayer, BS, DVM**  
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**Cary, John W., BS, MS, PhD**  
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**Christiansen, Dale, BS, DVM**  
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**Conrad, Paul W., BS, MS**  
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**Cronin, Eugene Hyrum, BS, MS, PhD**  
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**Crowe, Thomas D., BS**  
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**Dedrick, Allen R., BS, MS**  
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## 450 *University Faculty*

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Utah Cooperative Fishery Unit

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McDonough, Walter T., BS, MS, PhD  
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Pedersen, Marion Walter, BS, MS, PhD  
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Richardson, E. Arlo, BS, MS  
ESSA, U.S. Department of Commerce

Rogers, Dean, BS  
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Ryser, George K., BS  
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Smith, Clifton H., BS, MS  
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Smith, Jay Hamilton, BS, MS, PhD  
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Forest Service

Theurer, J. Clair, BS, MS, PhD  
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Thornley, Heber F., BS, MS  
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Torchio, Phillip F., BS, MS  
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Van Kampen, Kent R., BS, DVM, PhD  
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Wadley, Bryce Nephi, BS, MS, PhD  
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Wagar, J. Alan, BS, MS, PhD  
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Waite, W. Wayne  
Agricultural Research Service

Williams, M. Coburn, BS, MS, PhD  
Agricultural Research Service

Wright, James L., BS, MS, PhD  
Agricultural Research Service

Zimmer, David E., BS, MS, PhD  
Agricultural Research Service

## Personnel in Foreign Assignments

### BOLIVIA

Allred, Keith  
Ballard, Jay Clark  
Daines, Spencer  
Gonzales, Roberta  
Matthews, Darrell  
Tew, Orson

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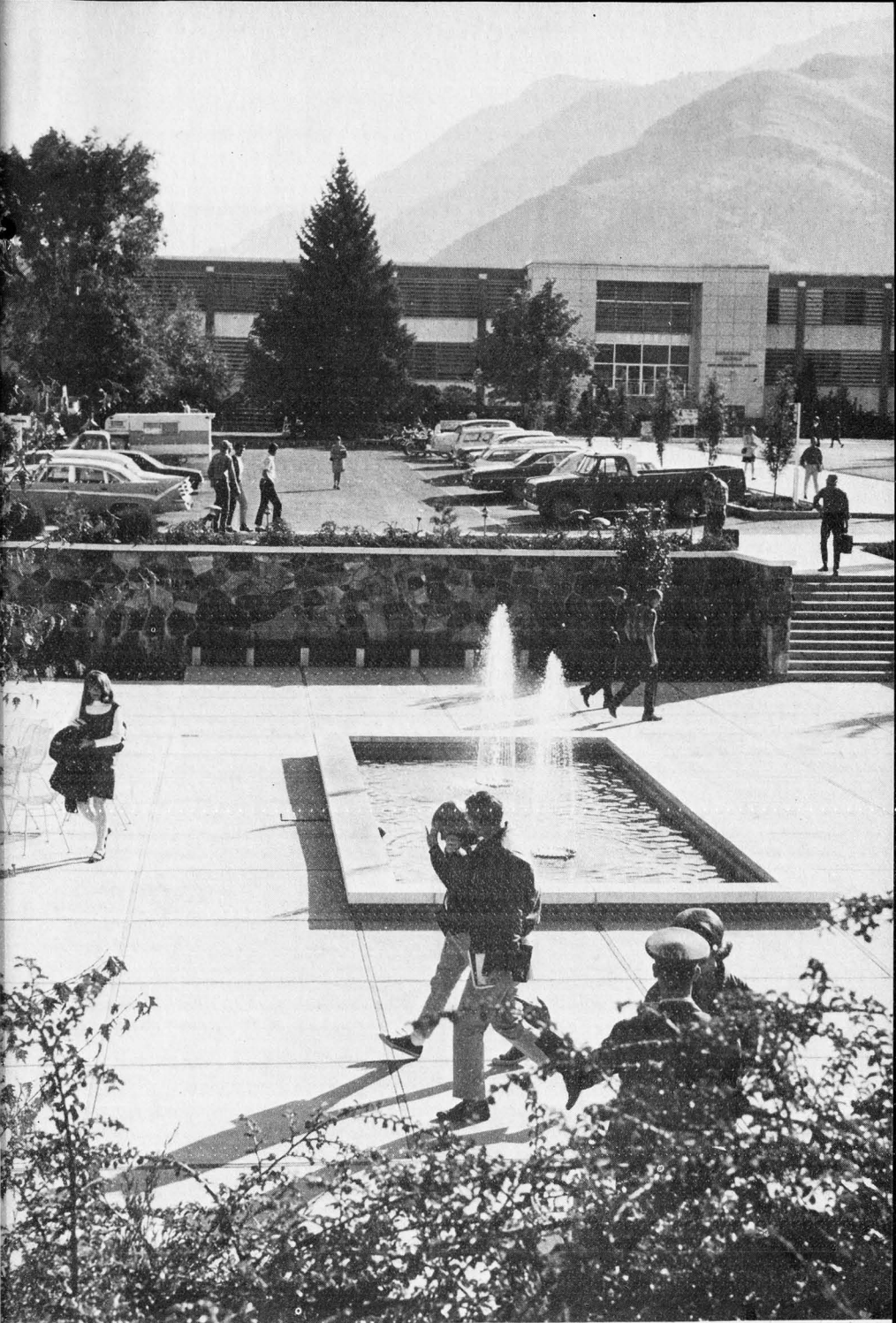
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**Tippetts, A. I.**

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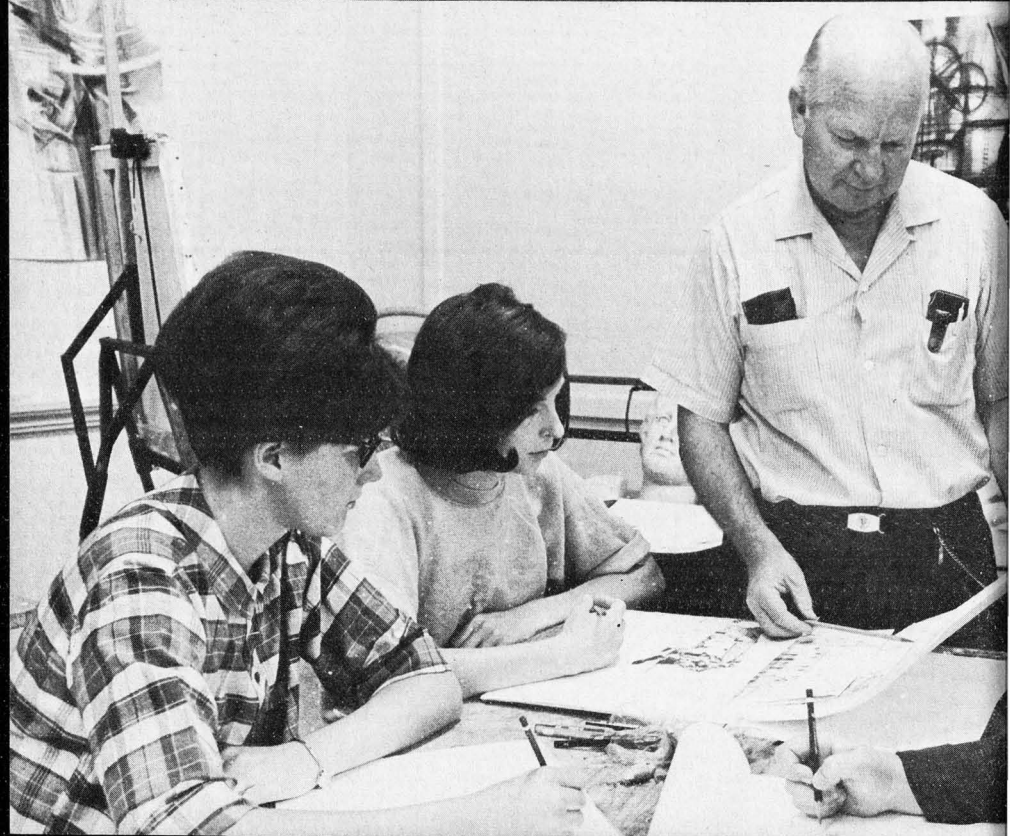
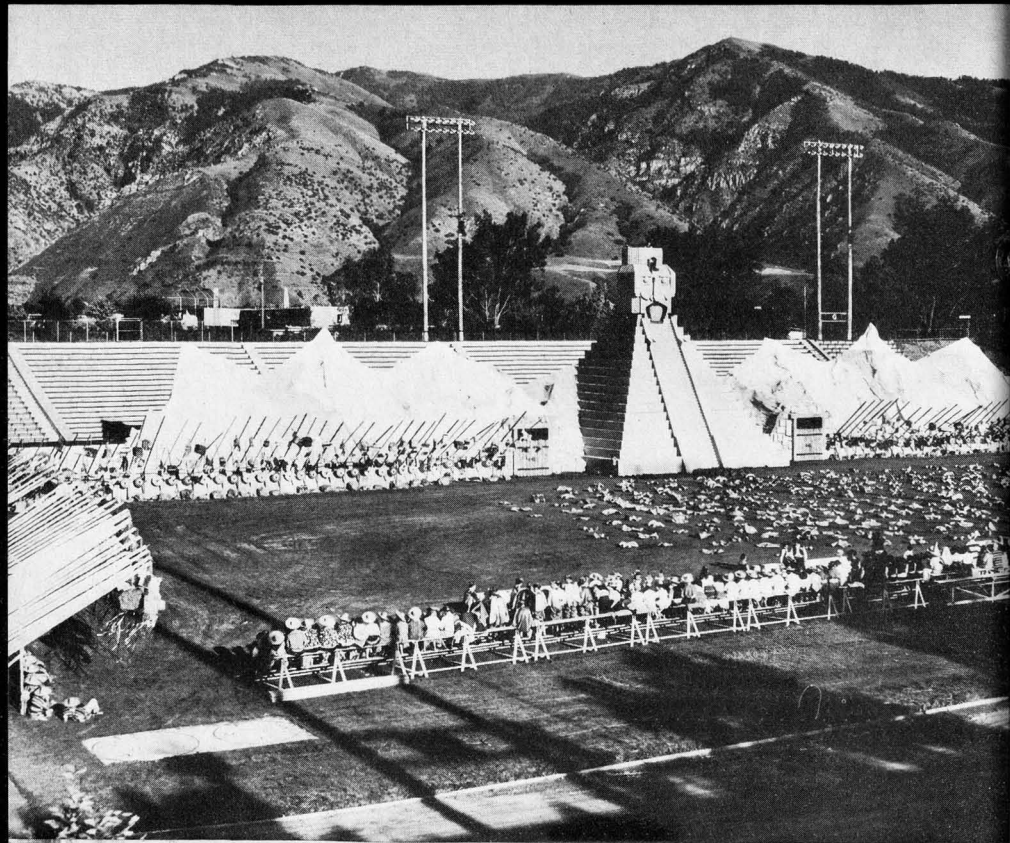
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49. Plant Operations Center, D-10
50. Plant Operations Shops, D-11
51. Industrial Education, D-11
52. Baseball Diamond, D-9
53. Tennis Courts, D-9
54. Edith Bowen Elementary Lab School, D-10

55. New High Rise Dorms, C-9
56. New High Rise Service Center, C-10
57. High Rise Dorms, C-10
58. Dormitory Cafeteria, C-10
59. Richards Hall, Men's Dorm, C-11
60. Bullen Hall, Men's Dorm, C-11
61. Radio-TV Center, B-11
62. Crops Research Center, C-12
63. Fine Arts Center, C-13
64. LDS University Stake Center, B-13
65. Water Research Lab., A-15  
by River on Canyon Road
66. Storage-Receiving, B-13
67. University Temporary Apts., B-11
68. Forestry Research Lab., B-10
69. LDS University Stake Center, A-9
70. David O. McKay Housing Center, A-8
71. University Trailer Court, A-7
72. University Apartments, B-6
73. New Assembly Center, C-16
74. Fraternity House, D-5
75. New Football Stadium, C-4
76. Car Pool, Garage, C-2
77. Veterinary Science Buildings, A-5
78. Metabolism Building, C-5
79. VanNoy Apartments, D-2

## Alphabetical Listing of Key Offices and Buildings

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 College of  
     Agriculture, E-12 (34)  
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     Business (New), E-13 (36)  
     Education, G-13 (7)  
     Engineering, D-13 (42)  
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     Humanities and Arts, E-13 (9)  
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Fine Arts, C-13 (63)  
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     Bullen Hall, C-11 (60)  
     David O. McKay Housing Center, A-8 (70)  
     Fraternity, Sorority Houses, F-6 (22)  
     Greaves Hall, D-14 (39)  
     High Rise Dorms, C-9, C-10 (55, 57)  
     Lund Hall, E-14 (37)  
     Merrill Hall, D-14 (41)  
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CAMPUS MAP  
UTAH STATE UNIVERSITY  
LOGAN, UTAH

