

1961

## General Catalog 1961

Utah State University

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*Agnes Smith*

*A. Smith*

# UTAH STATE UNIVERSITY

LOGAN

1961 • 1962

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In spring, summer, autumn or winter, Aggie Acres are picturesque. In foreground is President's Residence; in background is Old Main Tower.



# *Utah State University*

*Founded at Logan in 1888*



**1961-62**  
*Catalog*

# USU Calendar, 1961-62

## Fall Quarter (1961)

- |  |   |
|--|---|
| <b>September 11, Monday</b><br>All Staff on Campus                             | <b>September 23, Saturday</b><br>Registration, Old Students     |
| <b>September 13, Wednesday</b><br>General Staff Meeting                        | <b>September 25, Monday</b><br>Classwork Begins                 |
| <b>September 14, Thurs.; 15, Friday</b><br>Utah Conference on Higher Education | <b>September 26, Tuesday</b><br>Late Registration Fee Effective |
| <b>September 18, Monday</b><br>University Faculty Meeting                      | <b>October 13, Friday</b><br>Last Day for Changing Registration |
| <b>September 20, Wednesday</b><br>Testing, Students not previously tested      | <b>October 28, Saturday</b><br>Homecoming                       |
| <b>September 21, Thursday</b><br>Orientation, New Students                     | <b>November 23, Thurs.; 24, Friday</b><br>Thanksgiving Recess   |
| <b>September 22, Friday</b><br>Registration, New Students                      | <b>December 8, Friday</b><br>Classwork Ends                     |
|  | <b>December 11-14, Monday-Thurs.</b><br>Final Examinations      |

## Winter Quarter (1962)

- |   |  |
|---|--|
| <b>January 2, Tuesday</b><br>Registration                     | <b>January 5, Friday</b><br>Late Registration Fee Effective  |
| <b>January 3, Wednesday</b><br>Classwork Begins               | <b>March 13, Tuesday</b><br>Classwork Ends                   |
| <b>January 4, Thursday</b><br>Late Registration Fee Effective | <b>March 14-17, Wednesday-Saturday</b><br>Final Examinations |

## Spring Quarter (1962)

- |  |  |
|--|--|
| <b>March 21, Wednesday</b><br>Registration                 | <b>June 1, Friday</b><br>Classwork Ends                |
| <b>March 22, Thursday</b><br>Classwork Begins              | <b>June 4-7, Monday-Thursday</b><br>Final Examinations |
| <b>March 23, Friday</b><br>Late Registration Fee Effective | <b>June 8, Friday</b><br>Baccalaureate                 |
| <b>May 30, Wednesday</b><br>Holiday (Memorial Day)         | <b>June 9, Saturday</b><br>Commencement                |

## Summer Quarter (1962)

- |  |   |
|--|---|
| <b>June 18, Monday</b><br>First Session Begins | <b>July 23, Monday</b><br>Second Session Begins |
| <b>July 20, Friday</b><br>First Session Ends   | <b>August 24, Friday</b><br>Second Session Ends |

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## Utah State University Board of Trustees

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J. WHITNEY FLOYD <i>Acting Dean, College of Forest,</i> <i>Range and Wildlife Management</i>	
CARLTON F. CULMSEE <i>Dean, College of Humanities</i> <i>and Sciences</i>	

# Tuition and Other Fees

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

## Resident Students

	Student's First Quarter	Student's Second Quarter	Student's Third Quarter
Tuition and			
Registration .....	\$48	\$48	\$48
Building .....	6	7	7
Student Body.....	5	5	5
Athletic .....	5	5	5
Class Fee.....	1		
Total Fees.....	\$65	\$65	\$65

## Non-Resident Students

	Student's First Quarter	Student's Second Quarter	Student's Third Quarter
Tuition and			
Registration .....	\$48	\$48	\$48
Non-Resident .....	50	50	50
Building .....	6	7	7
Student Body.....	5	5	5
Athletic .....	5	5	5
Class Fee.....	1		
Total Fees.....	\$115	\$115	\$115

## Special Fees

**Excess Registration Fee:** For each excess hour (except two hours of Military Science, Air Science, or one hour of Physical Education) .....\$10.00

Students may register for 19 hours per quarter without paying excess registration fees.

Automobile Parking Permit: \$1.00 per year.

**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. \$1 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. Thereafter, through the seventh week only, courses may be dropped from but not added to the study list (academic program).

**Special Students—Registration fee.....**\$10.00  
Plus \$4 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 .....** 10.00

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

**Graduation Fee .....** 10.00

**Teacher Supervision Fee .....** 25.00

**Teacher Placement Fee .....** 5.00

**Teacher Placement re-registration.....** 2.00

**Locker Rental—Fall, Winter and Spring**  
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) ..... 1.00

**Progress Report, Adviser furnished one copy free. Additional copies.....** 25c to 50c

**Note fee .....** 2.00

**Cap and Gown Rental—Bachelor of Science .....** 3.00  
**Master of Science .....** 6.50

**Master's Degree Fee for binding and proofing thesis .....** 5.00

**College of Humanities and Sciences—Students using the language laboratory equipment are required to pay a fee of \$2 per quarter.**

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

**College of Forest, Range, and Wildlife Management—**  
Senior Field problems:  
Forestry 146 ..... 35.00  
Range Management 196 ..... 30.00  
Wildlife Management 171 ..... 35.00

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

**Military Uniform Fee .....** 5.00

**Music—Individual Instruction with members of the College staff:**  
One lesson per week (10 lessons) per Quarter (1 credit) ..... 30.00  
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.....	5.00
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, Chester J. Myers, Gwendella Thornley, Rex E. Robinson.	

Registration is not complete until you have presented your fee card at the Cashier's Window, office of the Controller and have paid your fees, and filed your 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.

According to the constitution of the Associated Students, you as a regularly enrolled student must obtain, at time of registration, a Student Body card which will admit you to all activities controlled by the Associated Students: athletic events—football, basketball, tennis and track—dramatics and musical entertainments, socials, lectures, etc.; will give you 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.

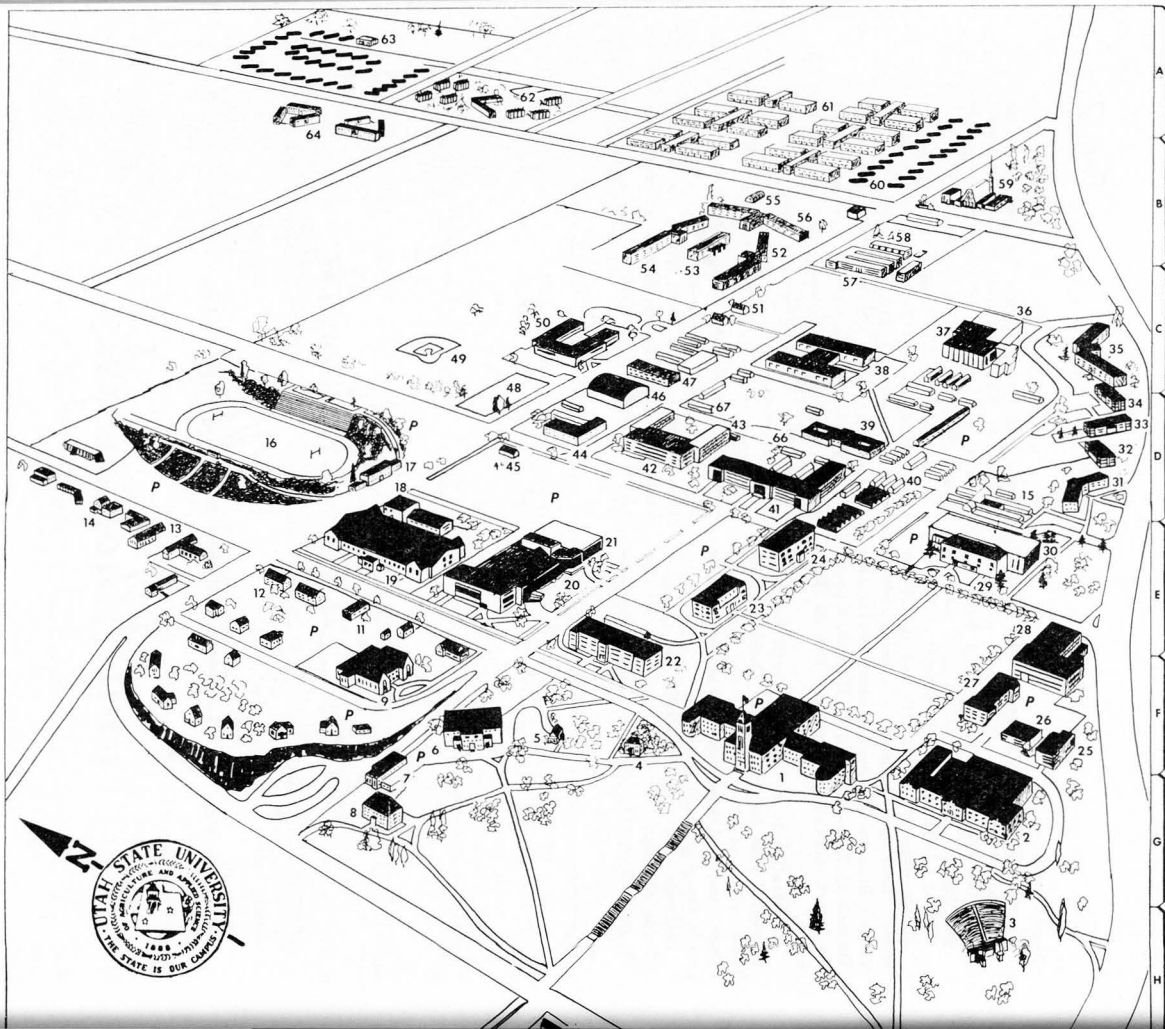
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# Utah State University

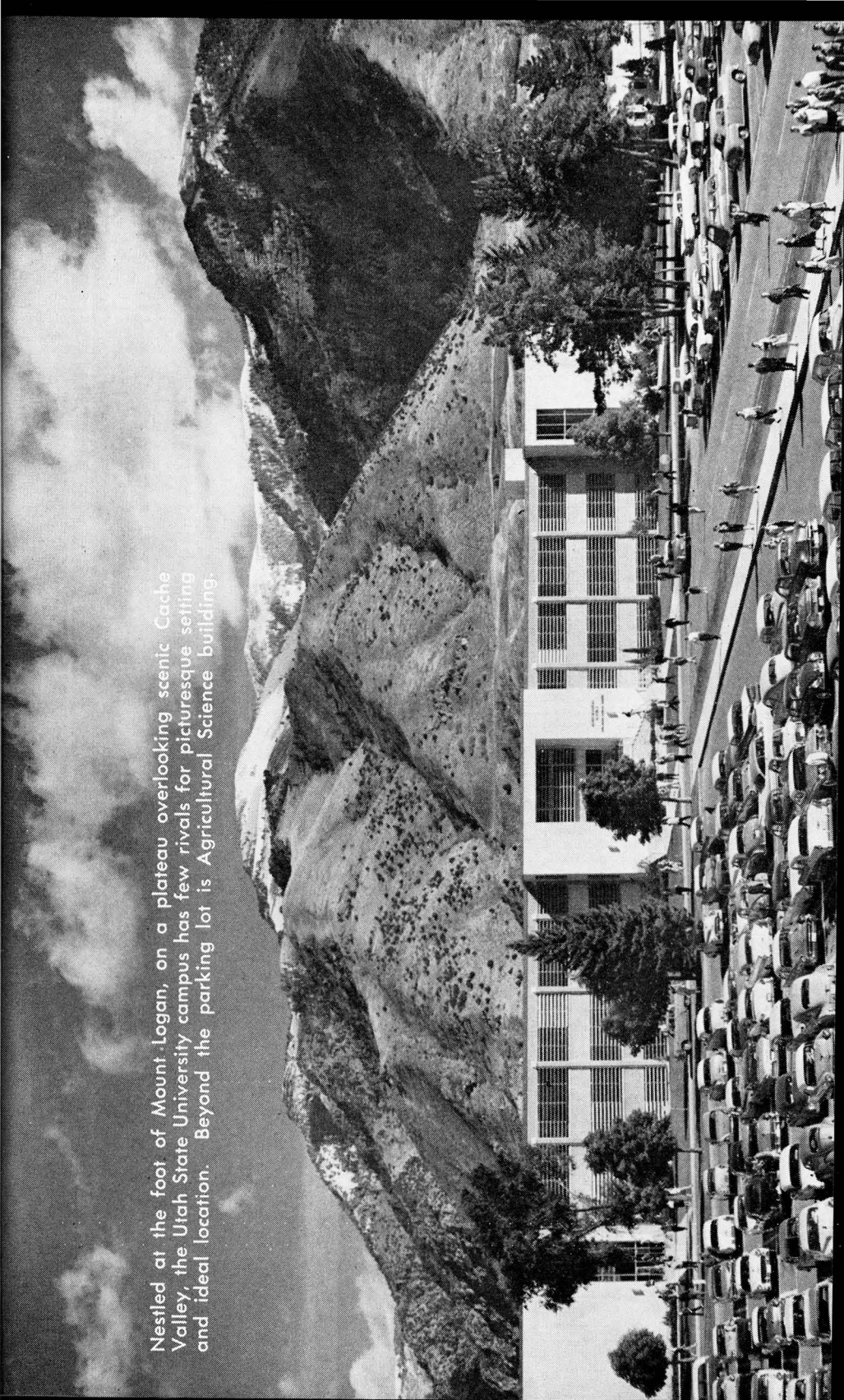
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Nestled at the foot of Mount Logan, on a plateau overlooking scenic Cache Valley, the Utah State University campus has few rivals for picturesque setting and ideal location. Beyond the parking lot is Agricultural Science building.





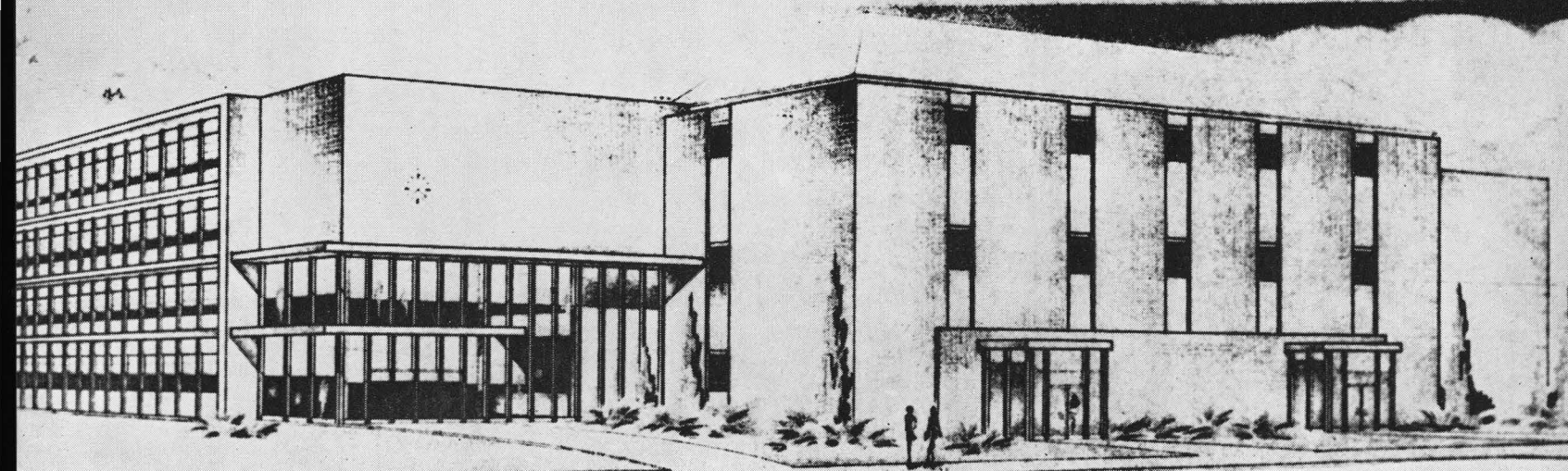


Many a lasting friendship is formed in strolls across the broad expanse of lawn known as the Quadrangle. Across the Quad can be seen a



For several months of the year Aggie Acres becomes a winter fairy land. Snow sculptoring, snowshoeing contests, skiing and ice skating are all popular pastimes. There is a beginners' ski tow on the front slope of University hill, and one of the country's finest ski runs at Beaver Bend in nearby Logan canyon. Photo shows Family Life building.



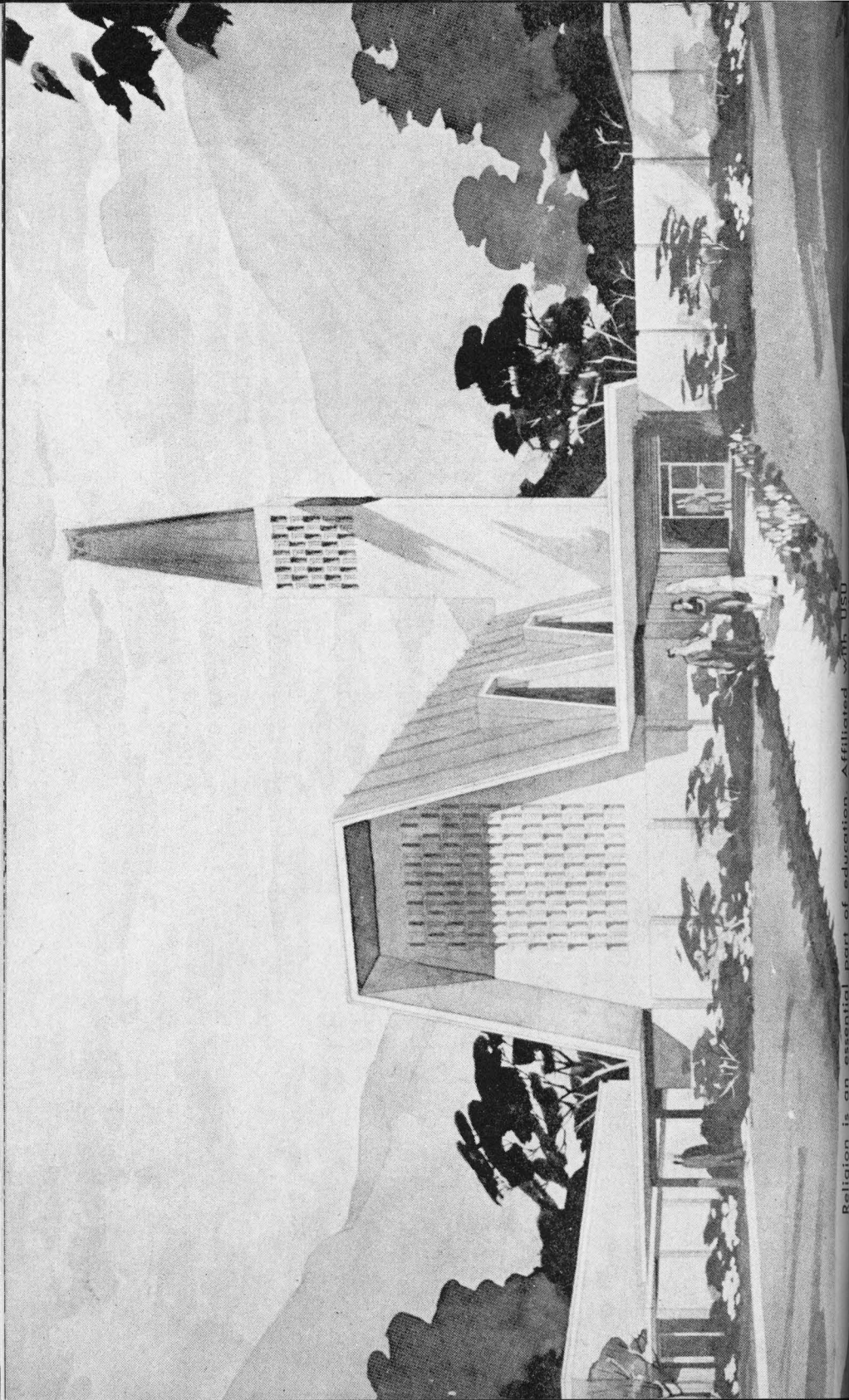


USU students not only have the pleasure of attending one of America's friendliest and most picturesque campuses, but they enjoy unsurpassed classroom and laboratory facilities. USU is in the midst of a great building program. Here is the sketch for a multi-million dollar



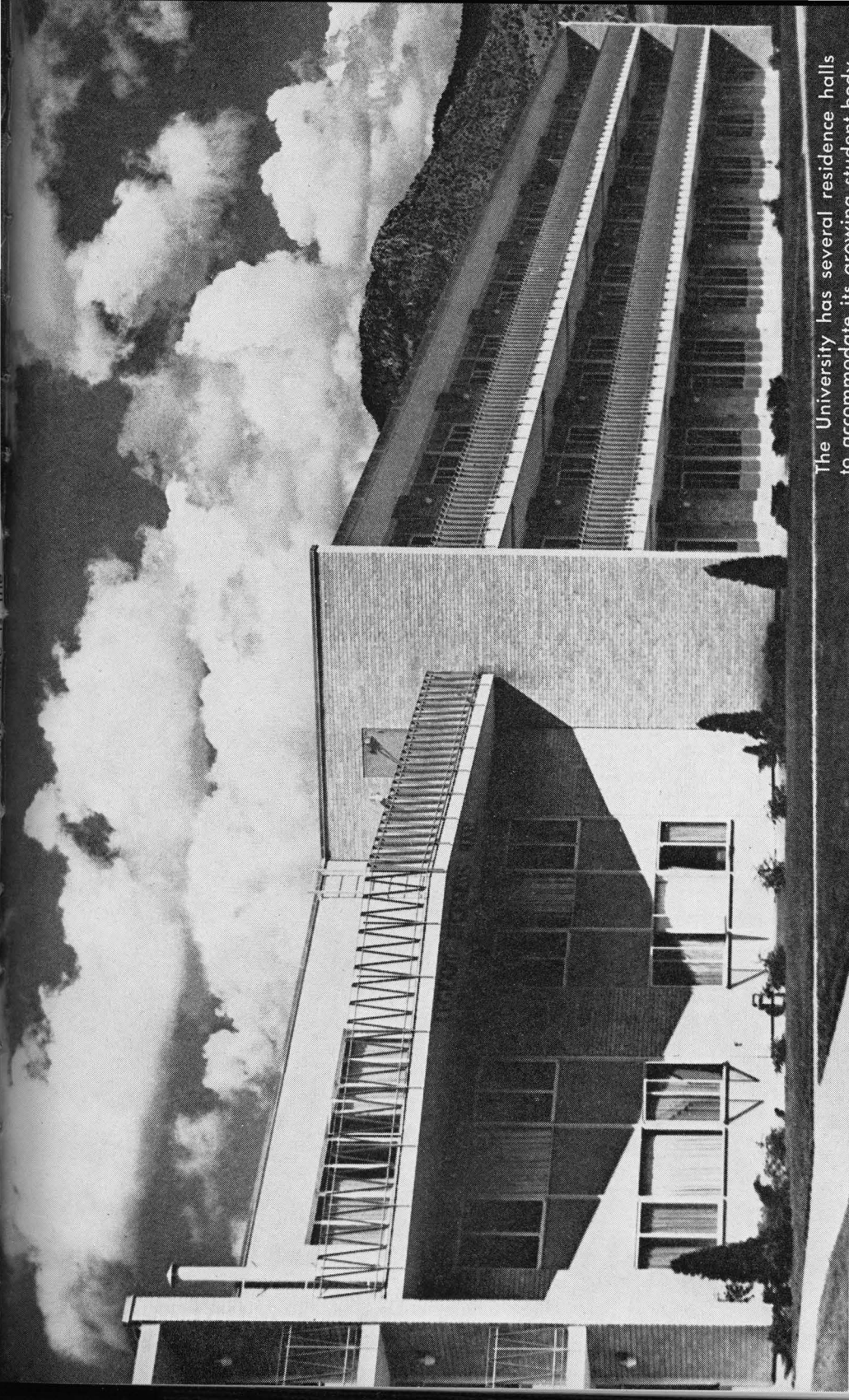
A proper balance between study and play is important. Center of social activity on campus is the Student Union Building, shown here on Agathon Day when hundreds of high school students visit USU.





Religion is an essential part of education. Affiliated with USBD

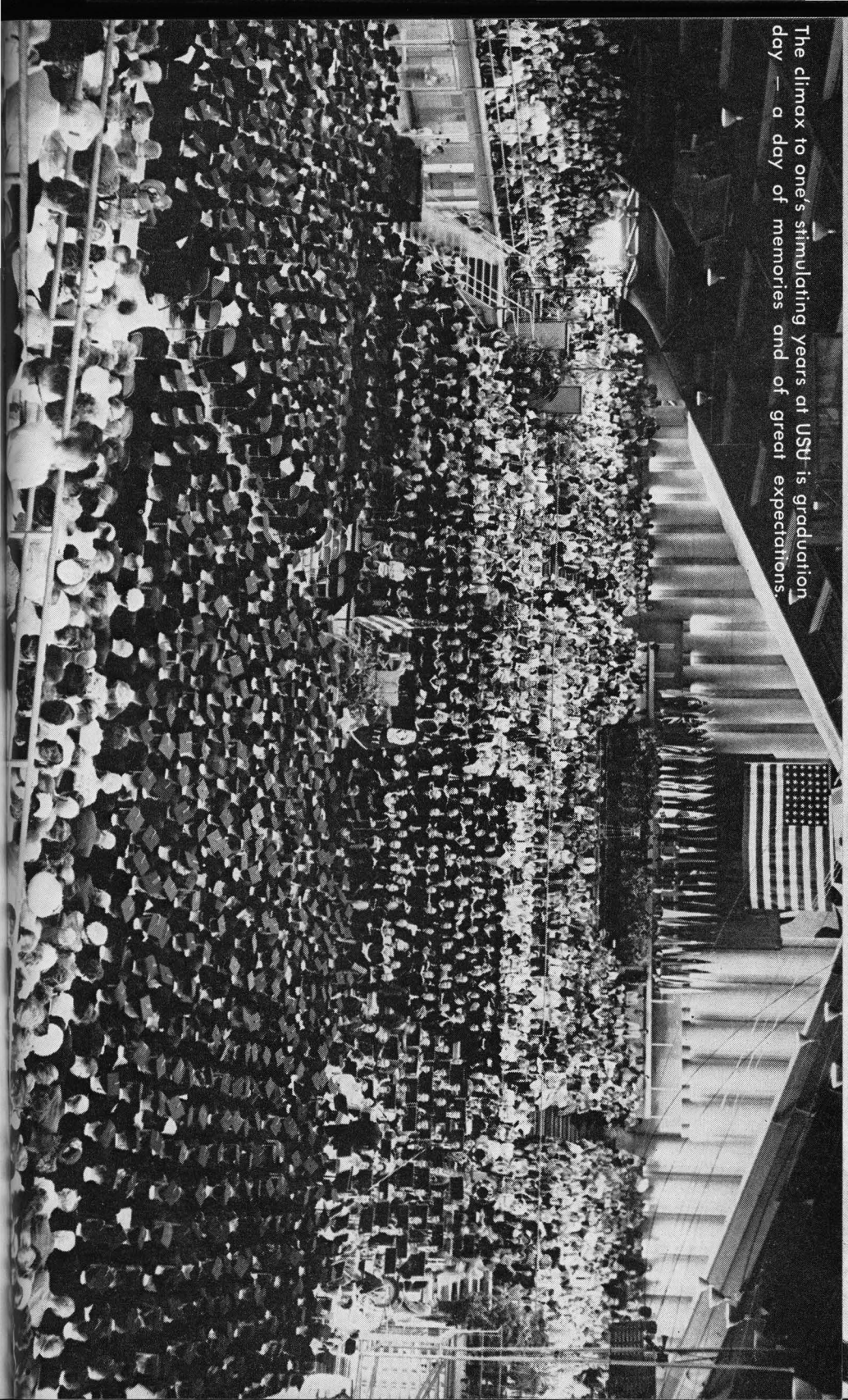




The University has several residence halls to accommodate its growing student-body.

OHIO STATE UNIVERSITY LIBRARY

The climax to one's stimulating years at USU is graduation day — a day of memories and of great expectations.



# Utah State University

## *Utah's State-wide University*

*History and Organization.* Utah State University and its two branch colleges belong to that great family of educational institutions known as Land-grant Universities. Each state has at least one of these collegiate institutions that had their origin in 1862 when Abraham Lincoln signed the Morrill bill. This bill provided for establishment of Land-grant institutions by the grant of federal lands for their material support.

USU operates under the constitution and laws of Utah, under which it and its Agricultural Experiment Station were established in 1888 as a part of the public educational system of the state.

These Land-grant institutions are characterized by the philosophy that through applied education most of the ills of mankind can be eliminated. In part, they had their origins in a protest made against the narrow curriculum found in the colleges and universities of a hundred years ago. A visitor to a Land-grant institution is impressed by the breadth of its academic offerings and the high quality of its teaching and research. Land-grant institutions have been given special assignments to study problems connected with water, soil, plant and animal life. There was little human progress until man began mastering the physical world around him and improved, through the science of plant and animal breeding, the species of life about him and brought new, improved varieties into existence. Rivers, weeds, pests, floods, diseases, or deserts have

little interest in the welfare of man. Some elements in nature man must control, improve and adapt to his needs. Others he must destroy or they will destroy him.

USU, from its origin in 1888, has been faithful to its Federal and State charters in providing the practical and applied aspects of the physical and biological sciences, social sciences, the humanities, and the arts. Utahns have wanted their sons and daughters skilled in the sciences of making a living, but not at the expense of the creative arts which enrich life with meaning and beauty. A student at USU may study agriculture in all of its many branches. He may also study art and music and literature. He may study forestry or floriculture, business or political science, engineering or English. He may study the origin of streptomycin, which was discovered at a Land-grant college, or he may choose to play an instrument in the University symphony orchestra. A mother may enter her three-year-old child in the nursery school. At the same time the father may be completing his studies for the Doctor of Philosophy Degree.

*A Land-grant university is characterized by its broad curriculum, its democracy and by its basic structure. It rests upon a firm educational tripod of teaching, research and extension. Utah State University is not a single-service educational institution, nor is it an aggregate of several individual schools or colleges. It is an institution of higher learning which provides technical, scientific and*



## 10 Utah State University

professional training. It is an agency offering scores of refresher short courses to thousands of Utahns daily engaged in the arts of homemaking and sciences of making a living. It is a multi-service university preparing people for the several pursuits and professions of life.

A progressive and dynamic industry must frequently re-tool and constantly study its markets. Schools should frequently make self-evaluation studies of their organization and educational objectives. Pruning and replanting are essential in institutions of higher learning as well as on the farm. Colleges and universities, like government itself, tend toward unnecessary proliferation in organization and programs. Vested interests costly to the state take root on campuses as well as at centers of government.

The University, following a critical post-war, self-directed study, underwent important and basic reorganization in order that it might better serve the state in its three major assignments.

*With the welfare of students and the general public in mind*, significant changes have been effected recently at Utah State University through the cooperative action of the Board of Trustees, the administration, and the faculty. Mounting evidence presented by graduates of recent years made apparent this fact: that the institution should be officially recognized for what it has been for a long time, namely, a full-fledged university. Therefore, what was originally (1888) known as Agricultural College of Utah, later (1929) as Utah State Agricultural College, became Utah State University on its sixty-ninth birthday

(March 8, 1957). Utah State now consists of seven resident colleges, a graduate school, and two branch colleges—Snow College at Ephraim, and the College of Southern Utah at Cedar City.

*Foreign Technical Assistance.* The international influence of USU has best been demonstrated through its program with the government of Iran. The University has a contract with the International Cooperation Adm., of the U. S. State Department, to give technical assistance to the people of Iran in the fields of plant science, agricultural engineering, animal science and agricultural extension work. In addition, the University serves in an advisory capacity to Karadj Agricultural College to aid in its program of services to the agricultural interests of Iran. The University has supplied nearly three dozen technicians to work in Iran.

USU students from foreign lands are being trained for leadership positions in their respective countries, in agriculture, engineering, drainage and farm mechanics, humanities, social sciences, natural and physical sciences, business administration and education.

A fourteen-member Board of Trustees is the governing body of the University. Twelve of these members are appointed by the Governor and ratified by the State Senate. Two others serve as ex-officio members: These are the Secretary of State and the President of the University Alumni Assn. All Board members serve free gratis. The Board elects its own chairman and vice-chairman, and appoints a secretary.

Dr. Daryl Chase is the tenth president of USU. He was ap-

pointed in 1954. 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, and Henry Aldous Dixon, 1953.

*Accreditation.* The University and all its departments are fully accredited. The University is accredited by the Northwest Association of Secondary and Higher Schools and is on the accepted list of the Association of American Universities and of the American Association of University Women. The University is a member of the American Council on Education

and is also listed by other accrediting agencies.

College of Engineering is accredited by the American Society for Engineering Education, and its Departments of Electrical Engineering and Civil and Irrigation Engineering are accredited by the Engineering Council for Professional Development.

College of Forest, Range and Wildlife Management is accredited by the Society of American Foresters and shares the University accreditation.

The College of Humanities and Sciences shares in the accreditation of the University, and in addition its Department of Chemistry is accredited by the American Chemical Society.



## University Library

LIBRARIAN *Milton C. Abrams*; ASSISTANT LIBRARIAN *Anthony W. Shipps*, REFERENCE LIBRARIAN *Ida-Marie Logan*; ASSISTANT REFERENCE LIBRARIANS *Hugh J. Barnes*, *Karlo Mustonen*<sup>1</sup>, *Anna Marie Smith*; CIRCULATION LIBRARIAN *Ann M. Caine*; CATALOGING LIBRARIAN *Dixie Drage*; SERIALS AND DOCUMENTS LIBRARIAN *Vilate Ransom*; ANNE CARROLL MOORE CHILDREN'S LIBRARIAN *Pearl Carter*; AUDIO-VISUAL AIDS LIBRARIAN *G. Leon Beutler*.

### Office on Library Mezzanine

The University Library maintains a program consistent with the growth and increased demands of the faculty and studentbody. The organization of the Library system is as follows:

(I) *Branch Libraries*, located in the colleges they serve: (A) Engineering. (B) Forest, Range and Wildlife Management.

#### (II) *Special Libraries*.

(A) *Anne Carroll Moore Library*, in the Edith Bowen Elementary School. A special collection of children's books and a working laboratory for the training school. (B) *Audio-Visual Library*, in the basement of Old Main. Provides film services on and off the campus. (C) *Claypool Map Library*, in the Geology department in Old Main. Features geologic maps as well as several other types which are available for general campus use. (D) *Hatch Memorial Library*, represents an authentic Sixteenth century setting. It houses the Library's collection of rare books along with the most valuable books on art and architecture.

(III) *Resources of the Library include*: (A) Approximately a quarter of a million volumes; (B) 2,600 periodical subscriptions; (C) 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.

(IV) *Teaching Program*. The Library instructional program serves two functions: (A) It stresses the use of Library resources through cooperation with all teaching and research programs; (B) It provides courses in a separate curriculum in the College of Education.

Under this latter program the requirements for a Class A Library certificate issued by the Utah State Department of Public Instruction may be filled. A Library minor may be completed in connection with a major in Education, and the courses can be used to meet the Library requirements of the Northwest Association of Secondary and Higher Schools.

<sup>1</sup>On leave.

## 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 nine 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. These credits are frequently referred to as "quarter hours." For example, a class offering five credits is said to be "five quarter hours." As a general rule, you attend class the same number of times per week as the credits or quarter hours offered. For example, a three-credit or three-hour class generally meets three times a week; a one-hour class, once a week; a five-hour 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.

That 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 Grad-*

*uate courses*; that is, courses taken by Graduate students.

*As a Freshman or Sophomore you may take any Lower Division course.* If there is a prerequisite for a particular course, it will be so stated in the course description. You may take an Upper Division course if you obtain in advance the consent of the instructor and your adviser.

*As a Junior or Senior you may take any Lower or Upper Division course.* Any prerequisites to a course will be mentioned in the course description. You may take certain Graduate courses if you obtain in advance the consent of the instructor and your adviser.

*As a Graduate student you 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, S, 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 you have to take the class all four quarters, but rather that you have your choice of any

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quarter. In some cases, such as (5F, W, S) even though more than one quarter is indicated, the course will not be given each quarter, but only one of these quarters, the exact one yet to be decided.

**For more definite, up-to-date information, you should refer to the Class Schedule published just prior to the beginning of each new quarter. All Catalog listings are subject to change.**

Occasionally you will see two or more closely related courses listed under one entry, such as English 1. 2. 3. **Basic Communication.** The credit entry will read: (3F, 3W, 3S) 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, 1S) 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 you one credit each quarter. Such courses,

however, are the exception. Most courses can be taken only once for credit.

In some classes the amount of credit for which you register can be individually arranged. One student may take two hours credit, another student three hours, 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 you wish to devote to it.

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, you should remember that this may be only tentative, and you may wish to check the Quarterly Class Schedule or consult the course instructor or department head to verify this.



*Admissions and Records*

Office of

## Admissions and Records

DEAN *L. Mark Neuberger*; RECORDS OFFICER *Asa L. Beecher*; ADMISSIONS COUNSELOR *Thelma B. Waddoups*.

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. Scheduling
  - Schedule bulletin
  - Assignment of rooms
  - Record of approved courses
5. Graduation
  - Checking and summarizing graduation requirements
6. Veterans' affairs
7. Statistics
  - Periodical reports
  - Special reports

## Admission: Entrance Requirements

Your 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.

You will not be permitted to register until all admission requirements have been met.

Applications for admission and credentials from schools previously attended must be received two weeks prior to registration day.

If your application is received after this deadline but prior to registration day, you will be scheduled to register after the regular registration schedule is completed.

If you register late as a result of late application you are subject to the late registration fee.

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 a country whose educational systems differ from that in the United States, except that students who graduate from high schools outside Utah may be denied admission if their credentials do not show a grade point average of 2.0 (C) or better for all academic high school work completed.

Admission to the University does not imply permission to register for any course for which you have insufficient preparation. Deans and department heads may require prerequisites for certain courses.

If you expect to become a candi-

date for any degree or diploma from any of the colleges of the University you must include among the units presented those preparatory courses specified as prerequisites to beginning University courses in the various fields. You are urged to give serious thought to the selection of a major field of interest. In this regard, you, in cooperation with your parents, high school principal or other school adviser, should plan your school program so as to meet the specific requirements for admission. If you fail to do this you may be delayed in starting your 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 list them in their college and departmental sections in this catalog.

Even though you are not a high school graduate you may be admitted by presenting satisfactory evidence of ability to do University work. This evidence may be demonstrated by presentation of an official transcript showing collegiate work previously taken as an unmatriculated student, or by examination taken in advance of registration. Such examinations as College Entrance Examination Board, the School and College Ability Test, or other approved standardized tests which provide appropriate appraisal of scholastic abilities of the applicant shall be accepted for fulfilling this requirement.

Students who have been admitted by the University but who do not have permission to enter one of the professional colleges or

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specialized departments may, with the approval of the Academic Standards Committee, enroll in the General Registration Unit of the Counseling Service. (See "Low Scholarship and Probation")

*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.

If you transfer to USU from a Utah junior college which has general group requirements, you will be considered as having completed USU group requirements if you present evidence of an associate degree. Without this evidence, you may be required to complete general lower division require-

ments.

Credit will be granted for work of satisfactory grade done in other accredited institutions. Transferred credit may be accepted for satisfaction of specific requirements if satisfactory evidence is presented that the work completed is equivalent to the work for which you wish it to be substituted.

If your transcripts from other colleges or universities show a grade point average of less than 2.0 (C) you may be denied admission to Utah State University. If you are admitted you are subject to the regulations regarding low scholarship students.

*Readmission.* Former students of the University returning after an absence of one or more quarters are required to file applications for readmission at least two weeks in advance, except that for the autumn quarter applications are not required of those in attendance the previous spring quarter.

## Registration and Credits

*Quarter Credits (Definition).* A quarter hour credit is the credit given for one hour of lecture or three hours of laboratory work each week for 12 weeks. Hereafter, for brevity, this unit will be known as a "credit."

*Class Standing.* Forty-eight credits of approved college work in addition to the prescribed entrance requirements are required for Sophomore rank; 96 credits for Junior and Upper Division rank; and 136 credits for Senior rank. These figures include the required credits in Physical Education, Military Science, or Air Science.

*Registration.* On each registration day, you are permitted to

register according to an alphabetical schedule to be announced later.

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

In case you cannot call for your registration materials at the hour scheduled for their release, you may



## Registration and Credits 19

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 you have presented your fee card at the cashier's window, office of the Controller, and have paid your fees and filed your registration cards with the Office of Admissions and Records. You will not receive credit for resident work unless you are officially registered for the specific courses involved.

The program of courses listed on your registration card, approved by your dean and filed in the Office of Admissions and Records, is your official registration for the quarter. You 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 you 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 you are allowed to register will be reduced by one and one-half credits for each week, or fraction thereof, that you are late in registering.

*Changes in Registration.* Any charge 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, you may change your registration on your own initiative, add or drop classes, by obtaining the approval of your teacher concerned, your faculty adviser, and the dean of your college, so indicated by their signatures on the change-of-registration form.

*The dean of the college in which you are 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 the Office of Admissions and Records.*

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

*Change-of-Registration Fee.* No charge for the first five school days after regular registration days. \$1 for each class change made thereafter.

*Procedure for withdrawal from the University.* If for any reason you find it necessary to leave the campus before the end of the quarter, you should take the necessary steps to withdraw from the Institution officially. The procedures to be followed in completely withdrawing from the University are as follows: (1) Call at the Office of Admissions and Records for the necessary blank forms. (2) Complete forms as required and discuss problems relating to withdrawal with those whose signatures are to be obtained in the order designated

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for appropriate clearance. (3) Obtain from each instructor the class enrollment cards and present these and the withdrawal forms at the Office of Admissions and Records. (4) Obtain clearance from the Office of Admissions and Records for any refunds which may be warranted. (5) Present processed withdrawal notice and Activity Card to the Cashier for refunds and/or for official, complete withdrawal.

Unless you are doing passing work in all of your classes at the time of withdrawal you may be denied the privilege of canceling your registration. In case you leave the campus without obtaining permission for cancellation of registration, "F" grades will be recorded if sufficient work has not been completed to warrant the reporting of passing grades.

*Visitor's Permit.* If you wish to attend regularly any class for which you are not registered you must obtain a visitor's permit from the Office of Admissions and Records. No credit will be allowed for such attendance. A fee of \$10 per class is charged for the privilege of auditing. Visitor's permit forms may be obtained from the Office of Admissions and Records. These forms include an authorization to the instructor for admitting you to the class. These 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 you the privilege of attending classes if you have not complied with regulations for admission to classes.

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

*Maximum Registration* without approval for excess credit is set at nineteen quarter hours exclusive of two credits in basic Military Science, or Air Science, or one credit in Physical Education. Only the dean of the college in which you are registering has authority to approve registration in excess of this maximum. You are 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. The registration is construed to include any extension, correspondence, institute, or other work carried by you for credit, or for removal of high school deficiencies, during the period of the school year.

*Minimum Registration.* The minimum registration for a full-time student load is considered to be twelve credit hours. To be eligible for student body offices you are required to be registered for twelve

quarter hours or more. Veterans are required to be registered for fourteen quarter hours or more to qualify for full subsistence. Students deferred by the Selective Service system under 1 SC status are required to maintain an average of fifteen credits per quarter.

*Incomplete Work:* You are required to complete by the end of the quarter all courses for which you have registered. This includes correspondence courses for which you may be registered on the residence registration fees. Incomplete grades can be granted by an instructor only when permission is granted by the dean before the close of the quarter. The necessary petition form may be obtained at the Office of Admissions and Records or your 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 credit is forfeited.

*Low Scholarship and Probation.* If you have not maintained an average grade of "C" or better, or if you are failing to obtain passing grades in twelve or more credits during the preceding quarter, you are automatically placed in the low scholarship group. No person in the low scholarship group shall be eligible to be elected, appointed, or to hold office in the studentbody organization.

Low scholarship students shall be placed on "warned status" at the end of the first quarter that his average is below "C." If a student does not then attain a "C" average in the next succeeding quarter he will be placed on probation. He may also be placed on probation at the discretion of his Dean if the Dean feels his over-all achievement is unsatisfactory. Parents or guard-

ians will be notified of the probational status by the Dean of Student's Office. Notation of probation shall be entered on the transcript of credits by the Office of Admissions and Records.

If a student does not maintain a "C" average during the next succeeding quarter after being placed on probation, he will be suspended from his academic college. If a student is denied permission to re-register in any college of the University after two successive quarters of "warned" and "probationary" status respectively, he will be officially dropped from the University and will be required to remain out of the institution for a period of one full quarter before an application from him for permission to re-register will be considered. 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 to the Academic Standards Committee 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 Academic Standards 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

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not maintain a "C" average may be denied permission by the Academic Standards Committee to re-register in that unit. In such cases the Chairman of the Academic Standards 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 probation and fails to maintain a satisfactory grade point average for two quarters, he may be suspended at the end of the second quarter if coming directly into the University from high school. Students transferring from another collegiate institution, 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 Air Science.

*Credit by Examination.* In special cases, you 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.

*Special Examination.* A maximum of 18 quarter hours' credit 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 you enroll, the credits gained will be included as part of your load for the quarter. 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.

You may earn as much credit by home study courses in the two-week Christmas holiday period as in a similar period in residence, without having it added to your load the preceding or following quarter.



# Lower Division Requirements

The Lower Division comprises the work of 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 you for the major work upon which you will concentrate in the Upper Division.

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

If you expect to become a candidate for the Bachelor of Science degree you should plan your courses with great care through consultation with your faculty advisers, major professor, and dean, to assure the best choice of courses for filling the groups and to provide the proper foundation for advanced work. Failure to do this may necessitate an extra year to complete the work for the desired degree.

To complete the work of the Lower Division you should satisfy the following requirements:

(1) Remove any deficiencies that may exist in the entrance requirements.

(2) Complete 96 credits (quarter hours) of work (including Military Science, Air Science, or Physical Education) with an average of "C" or higher.

(3) Prepare a foundation of at least 15 credits for the field of specialized study in the Upper Division.

(4) Satisfy the (A) English, (B) Group, (C) Military Science, Air Science or Physical Education requirements, as follows:

## (A) *English Composition.*

(1) A placement examination in English is required of all freshmen.

(2) 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.

Note: For graduation all students must present nine hours in Basic Communication or its equivalent. See Paragraph 6 under "Summary of Requirements for Graduation."

## (B) *Group Requirements.*

A total of 40 credits must be selected from the following four groups with not less than eight credits nor more than 12 credits being counted in any one group.

(1) *Biological Science.* This group requirement may be satisfied by taking any one of the following combinations of courses:

(a) Biology 1 and either 5 hours of lower division Bacteriology or Physiology 4 or 30.

(b) When more technical courses are required they may be used to satisfy this group requirement if taken in any of the following sequences:

(1) Botany 24 and 25.

(2) Zoology 3 and 4.

(3) Any two of the following three series:

(a) Bacteriology 10 or 70 and 71; (b) Botany 24 or 25; (c) Zoology 3.

If you already have a satisfactory knowledge of general biology, as

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demonstrated by examination, you may satisfy this group requirement by taking Bacteriology 10 or 70 and 71 and Physiology 4, 30.

### (2) *Exact Science.*

Chemistry—any course of Lower Division grade.

Geology 1 or 3, 4.

Chemistry 31, Geology 31, Physics 31 are designed and integrated for general education.

Mathematics — any course of Lower Division grade except that Mathematics 20 may be used for Elementary Education majors only.

Physics—any course of Lower Division grade.

### (3) *Language and Arts.*

Visual Arts 1, 10, 11; Music 1, 25, or 26, 27 or 28, 33. Theatre 1.

English—any literature course of Lower Division grade. Upper Division literature courses may also be used for group-filling purposes if instructor of a desired course approves enrollment.

Landscape Architecture 3.

Language—any beginning course in French, German, Portuguese, Spanish or Latin.

Speech—any course of Lower Division grade.

### (4) *Social Science.*

Agricultural Economics 71, 72,

73, but only one of these courses (3 hours) can be counted.

Economics 51, 52.

History—any course of Lower Division grade.

Political Science 1, 10, 70.

Psychology 53.

Social Science 1, 5, 6, 7.

Sociology 10, 70.

Majors in departments in the College of Humanities and Sciences should see the introduction to the College of Humanities and Sciences section of this catalog for suggested courses with which to fill group requirements.

Students in divisions that prescribe the curriculum for a full four-year course (as Forestry, Agricultural Education, and Engineering) are exempt from group requirements listed above. If you transfer from one of these divisions, you are responsible for fulfilling all of the course requirements of the new division.

### (C) *Physical Education.*

Six quarters of work in Physical Education activity classes are required of all women students. Members of the sponsor corps may substitute Sponsor Corps credit (not to exceed three credits) for Physical Education credit. All men students are required to take six quarters of work in Military Science, Air Science, or Physical Education.

# Upper Division Requirements

Sixty credit hours 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 you change from a prescribed course to a major under the group elective system you 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.

As a freshman or sophomore you may register for upper division classes and receive credit toward senior college requirements, if such courses are recommended by your adviser and approved by the instructor. Courses so taken will count in the 60 credit hours of upper division required for graduation.

*Major Subject.* You 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, you should consult the head of the department in which you have decided to major. The head of the

department will assign you an adviser. Your registration in each succeeding quarter should be carefully checked and approved by your adviser (called the major professor) in order to assure proper selection and sequence of courses for satisfying institutional and departmental requirements.

Your major department has the authority to prescribe not less 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). Your major department and the dean of your college shall also prescribe such other related courses as may be considered desirable, provided always that your free electives may not be 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 you successfully pursue further prescribed work in one of these fields for an additional year at an approved institution, you may be granted a Bachelor of Science degree by this University. You need not comply with general major-minor requirements as previously outlined.

*Minor Subjects.* You are permitted to choose your 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

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in more than one department must have the approval of the dean and the major professor.

Courses used to satisfy the English composition, the basic groups, Military Science, Air Science, or

Physical Education, and freshmen 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 Science, Master of Science, Master of Education, Master of Forestry, Civil Engineer, Irrigation Engineer, 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 as a candidate for a certificate, a diploma, or a degree, you are held to compliance with such changes, so far as the uncompleted part of your course is affected.

You are expected to familiarize yourself with institutional rules and regulations. The responsibility for satisfying the requirements for graduation rests upon you.

*If you do not graduate in the class with which you enter you are held to the requirements, including entrance, of the class with which you do graduate.*

### Two-Year Certificate

The College of Agriculture, Engineering, Business and Social Sciences and Humanities and Sciences 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 B.S. degree.

In most cases the courses are arranged so that you may, at a later date, complete the four-year course 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 Division.

To qualify for a Certificate you must:

(1) Satisfy the entrance requirements.

(2) Complete 96 credits, including the required work in Physical Education, Military Science, or Air Science.

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

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

(5) 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.

(6) 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 of Science Degree

The University confers the degree of Bachelor of Science upon students who meet the specified requirements of any of the seven resident colleges.

Before you can become a candidate for a baccalaureate degree, the abstract of your record in the University must show: first, that you have satisfied the entrance requirements prescribed for the class with which you expect to be graduated; second, that the collegiate work for which you have credit, your conditional and other pending credits, the completion of which you are reasonably assured, and the work for which you are registered or are planning to register, together satisfy the requirements for graduation, including Physical Education, Military Science, or Air Science, as prescribed for your class.

If you are planning to graduate at the next Commencement you should consult your major professor and jointly prepare the "Admission to Candidacy" form not later than the fourth week of the fall quarter. You are 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 after the requirements-for-admission have been satisfied. Responsibility for satisfying the requirements for graduation rests upon you.

(1) For women, six quarters of work in Physical Education, provided that candidates officially excused from Physical Education present one credit of other work for each quarter that they have been excused.

(2) Men must complete six quarters of either Physical Education, Military Science or Air Science. If exempt from Air Science, Military Science and Physical Education, you must present one credit of other work for each quarter you 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 you are discharged in accordance with the provisions of Army Regulation 145-350 or Air Force Regulation 45-48 and AFROTC Manual 46-1.

(3) One-hundred-eighty-six credits of acceptable collegiate work, including the required credits in Physical Education, Military Science or Air Science, of which a minimum of 150 credits must be "C" grade or better.

(4) Sixty credits of Upper Division work.

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

(6) The completion of the group requirements and of nine hours in Basic Communication or its equivalent. For students who entered the University prior to 1955, the completion of English 10 and 110 or of English 17, 18, and 19 will be considered as the equivalent of nine hours in Basic Communication.

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

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

(9) Candidates for a Bachelor's degree must complete at least 45 credits in residence or off campus work at Utah State University, exclusive of any home study credit as provided in No. 7 above. Of these 45 credits, a minimum of 15 must have been earned in residence at the Logan campus within one quarter or two Summer School sessions, not necessarily consecutive.

(10) 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, you must have twice as many grade points as you have 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.

(11) The candidate must file an "Application for Admission to Candidacy" not later than the fourth week of the fall quarter preceding graduation. 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.

(12) The candidate should file an "Application for Graduation" with the Office of Admissions and Records and pay his graduation fee at the Cashier's office as soon as possible after the first day of the winter quarter. Late fee will be charged if application is made after January 15. If you fail to file your application for graduation by May 1 you will be held over to the next year's commencement.

(13) The candidate must have discharged all University fees.

(14) Attendance at Commencement Exercises is expected of all candidates. If unable to attend you must notify the dean of your college and be officially excused in advance.



*College of Agriculture*

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Bachelor of Science

Master of Science

Doctor of Philosophy



*College of*

# Agriculture

William H. Bennett, Dean

## Office in Agricultural Science 131

Agriculture today is a dynamic, rapidly changing industry. There are few fields of work that can offer you such interesting and challenging opportunities. Agriculture includes much more than farming or producing food and fibre. 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 (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 you unlimited opportunities. But it is highly competitive and to be successful you must be well trained and be able to produce and manage efficiently.

There are nine departments in the College of Agriculture: Agricultural Economics, Agronomy, Animal Husbandry, Applied Statistics, Botany, Dairy Industry, Horticulture, Poultry, and Veteri-

nary Science.

The programs of study of the College of Agriculture are designed to provide the training needed to enable you to:

- Become a successful farmer or rancher.

- Qualify for employment in agricultural industry: farm equipment, farm building, water and irrigation, agricultural chemicals, fertilizers, food processing, grain and seed processing, meat and poultry packing, feed manufacturing, dairy processing, fats and oils, textiles and fibers, floriculture, and hatcheries.

- Become a teacher of agriculture in high school or college, a county agent, or an extension specialist in a land grant college.

- Become a research scientist in industry, in an agricultural experiment station, or in a government agency.

- Make a career in agricultural communications: radio, television, news, publications, advertising agencies, photography.

- Become a conservation specialist to conserve and rebuild our natural resources.

- Enter public and private services: U. S. Government, foreign agricultural service, city, county, and regional planning, agricultural consultant work, private business.

- Become a leader in the community in which you live so you

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can intelligently serve your fellow-men and fulfill your obligations as a citizen of a free world.

Utah State University, Utah's land grant institution, is equipped to help you qualify for these special positions as well as to give you a broad general education in the basic sciences and in the humanities. Its staff and facilities provide an opportunity for you to prepare 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 new Agricultural Science Building* houses the administrative offices of the College of Agriculture, the Agricultural Experiment Station, and the Extension Services. The Departments of Applied Statistics, Agricultural Economics, Agronomy, Horticulture, and Agricultural Education are also housed

in this building, where modern classrooms and well equipped laboratories are available for teaching and research.

The Animal Husbandry, Dairy Industry and Poultry Husbandry Departments are housed in the Animal Husbandry Building and Botany in the Plant Industry Building on the campus.

*The Animal Husbandry Farm* is one-half mile north of the campus. Facilities are available for housing of livestock and for animal research work. These facilities include equipment for the study of animal metabolism, physiology, and nutrition.

*The Dairy Farm* is one mile north of the campus. Here are modern facilities for housing dairy cattle and for research in dairy cattle management, nutrition and breeding. Milk is transported from the dairy farm to the processing plant on the campus by a large refrigerated tank truck.

*The Poultry Farm* is one mile north of the campus, adjacent to the Dairy Farm. The poultry plant is well equipped for instruction and research in poultry husbandry. Extensive investigations are under way on methods of feeding, housing, and disease control, to obtain the most economical production.

*The Turkey Farm* is one mile north and east of the campus. Research in turkey breeding and management is conducted at this farm.

*The Veterinary Science Building* has well equipped laboratories, isolation rooms, and facilities for teaching and research in animal and poultry physiology, hygiene, and disease. A veterinary clinic is maintained for diagnostic service for livestock and poultry producers.

## Curricula in Agriculture

You may work toward the Bachelor of Science degree in one of four divisions or areas of interest as follows:

(1) *Agricultural Science*, which will prepare you for graduate work in one of the basic agricultural sciences and for a career in scientific or technical agriculture. You may select between Biological Science or Applied Science (Animal Science, Plant Science, Applied Statistics).

(2) *Agricultural Business*, which will give you considerable training in the business phases of agriculture.

(3) *General Agriculture*, which will give you a broad, general training in scientific and practical agriculture and prepare you for general farming, agricultural service work, etc. A major in General Agriculture is offered in the departments of Agricultural Economics, Agronomy, Animal Husbandry, Dairy Industry and Horticulture.

(4) *Agricultural Education*, which will prepare you to become an agricultural teacher.

Minimum requirements for the B.S. degree under each of these divisions are listed below. In addition you must fill University requirements and the requirements of the department in which you major.

### Agricultural Science

(a) Biological Science	Hours
Exact Science <sup>1</sup> .....	30
Biological Science <sup>2</sup> .....	15
Social Science .....	8
Language and Arts .....	8
Basic Communications .....	9
P.E. or M.S. ....	6

Meet all departmental requirements for major, and University requirements for graduation.

For many students the 30-hour requirement in exact science is not

enough, but in fields like taxonomy, some courses other than exact science are more helpful. Your department decides what additional courses are required.

(b) *Applied Science* (Animal Science, Plant Science, Applied Statistics)

	Hours
Exact Science <sup>1</sup> .....	45
Biological Science <sup>2</sup> .....	15
Language & Arts .....	8
Social Science .....	8
Basic Communications .....	9
P.E. or M.S. ....	6

Meet all departmental requirements for major, and University requirements for graduation.

<sup>1</sup>Exact Science requirements must be filled from the following courses: Math 35, 44 or 46, 97, 98, 99; Physics 17, 18, 19 or 20 and 21 and 22; Chemistry 3, 4, 5, 12, 115 (under exceptional circumstances 10 and 11 may be authorized by the head of the major department), Geology 3, and any upper division courses authorized by the student's major department.

<sup>2</sup>Biological Science requirements must be filled from the following courses: Botany 24, 25; Zoology 3, 4, 112; Bacteriology 70, 71.

### Agricultural Business

Freshman and Sophomore Years	Hours
Exact Science <sup>3</sup> .....	24
Biology <sup>4</sup> .....	10
Social Science .....	32
Language & Arts .....	8
M.S. or P.E. ....	6
Basic Communications .....	9
Electives .....	7

Meet all department requirements for major, and University requirements for graduation.

<sup>3</sup>In addition to the courses listed above Math. 24, 25, 26 and Geology 31, 32, 33 will be allowed.

<sup>4</sup>In addition to the courses listed above Zoology 1 and Physiology 4 will be allowed.

### General Agriculture

	Hours
Exact Science <sup>1</sup> .....	24
Biological Science <sup>2</sup> .....	15

<sup>1</sup>Exact science requirements should be filled from the following courses: Chemistry 10, 11, 12 or equivalent; Math. 24, 25, 26, 34, 35, 44 or 46, Geology 3.

<sup>2</sup>Biological science requirements should be filled from the following: Botany 24, 25; Zoology 3, 4; Bacteriology 10 or 70 and 71.

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Social Science .....	8
Language & Arts .....	8
Basic Communications .....	9
Irrigation & Drainage .....	3
Gen. Agriculture <sup>3</sup> .....	1
P.E. or M.S. ....	6

<sup>3</sup>Limited to new freshmen in Agriculture.

In addition, under the General Agriculture curriculum you must take Agronomy 56, Agricultural Economics 71, 72, and 73, (nine hours), or the equivalent, and a minimum of one three-credit course in each of two departments in applied animal science and one three-credit course in each of two departments in applied plant science. Any deviations from these requirements must have the approval of the Dean.

### Agricultural Education - Four Years

	Hours
Biological Science <sup>1</sup> .....	20
Exact Science <sup>2</sup> .....	23
Agriculture .....	84
Education .....	35
Language & Arts .....	8
Social Science .....	10
Basic Communications .....	9
M.S. or P.E. ....	6

Meet all departmental requirements for major and University requirements for graduation.

<sup>1</sup>Biological Science requirements must be filled from the following courses: Botany 24, 25; Zoology 3, 4; Bacteriology 70, 71; Zoology 12.

<sup>2</sup>In addition to the courses listed above, Math. 24, 25 or 26 and Geology 31, 32, 33 will be allowed.

### Two-Year Program In Agriculture

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

In addition to completing a 20-

credit major in the plant sciences, the animal sciences or agricultural economics, you must take six credits in the groups in which you do not major. For example, if you major in animal science you must complete, in addition to 20 credits in your major field, six credits in plant science, six credits in agricultural economics and six credits in agricultural engineering. You must also take the following courses: Basic Communications, nine credits; Biology, five credits; Physical Science, five credits; and Social Science, five credits.

You may also take the following courses: Agricultural Economics 71, 72, 73; Agricultural Engineering 1, 14, 15; Agronomy 7, 8, 56; Animal Husbandry 1, 10; Dairy Husbandry 2, 6; Horticulture 1, 2, 4; Landscape Architecture 3; Poultry Husbandry 1; Veterinary Science 20; Irrigation and Drainage 10.

You must complete 96 credits to obtain a certificate.

**1.—General Agriculture.** Open only to freshmen students in Agriculture. A course to assist Agricultural freshmen in adjusting to college life and to acquaint them with our changing Agriculture. (1F) **Dean and Staff**

*Agricultural Curricula Compatible with ROTC Training.* Wherever possible, students in agriculture are encouraged to take advantage of the Military Science training offered at USU. Under present programs a number of courses in the College of Agriculture will be accepted for ROTC credit, and students in agriculture should not find it too difficult to complete requirements for a degree in Agriculture and at the same time meet the ROTC requirements. The training in leadership that comes through ROTC is some of the most valuable training that you can get in college.



## Department of

# Agricultural Economics

PROFESSORS *George T. Blanch*, HEAD, *Roice H. Anderson*, *Earnest M. Morrison*; ASSOCIATE PROFESSORS *Lynn H. Davis*, *Ellis W. Lamborn*, *N. Keith Roberts*, *Morris H. Taylor*; ASSISTANT PROFESSORS *Rondo A. Christensen*, *Lloyd A. Clement*, *Douglas C. Strong*, *E. Boyd Wennergren*; COLLABORATORS *Clyde E. Stewart*, *John M. Zimmer*.

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Agricultural Economics is a study of economic and business principles and problems involved in producing and marketing agricultural products. To be a well trained Agricultural Economist you become familiar with major scientific principles and practices of crop and livestock production and principles of economics and business practices. With this training a wide range of employment will be open to you. This will include the successful operation of your own farm, professional farm manager, teacher, research and extension worker at either state or federal level; foreign service specialist, or owner-operator or employee of any business that buys, sells, or processes agricultural products or provides supplies or services for agriculture.

**Bachelor of Science Degree.** If you plan to pursue a course of training that ends with a BS degree you should enter *Curriculum for General Agriculture* for the freshman and sophomore years, then complete the course listed below for *General Agriculture in Agricultural Economics*.

If you plan to pursue a course of training that leads beyond a BS degree, you should enter the curriculum in *Agricultural Business and Economic Science* for the four-year course listed below. Equivalent and substitute classes are acceptable if you are a transfer student.

## Graduate Study

**Master of Science Degree.** You will find excellent facilities in the Department for graduate study in several divisions of Agricultural Economics such as: agricultural business management, farm management, land economics, agricultural finance, and agricultural marketing. Research in these areas is conducted by the Department Staff and the Federal Collaborators, with the assistance of graduate students. All upper division courses in Agricultural Economics may be used for graduate credit in an Agricultural Economics major.

Agricultural Economics 71, 72 and 73 or their equivalents, or upper division standing are prerequisites to all other courses in Agricultural Economics.

## General Agriculture in Agricultural Economics

In addition to meeting the College of Agriculture requirements for the freshman and sophomore years the following work is suggested during the junior and senior years.

Area	Hours
Agricultural Economics .....	21
Economics .....	11
Animal Science .....	12
Crop Science .....	13
Electives .....	36
	93

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*Agricultural Business and Economic Science* is a four-year curriculum. The lower division requirements are as follows and should be completed during your freshman and sophomore years:

Course	Hours
Exact Science <sup>1</sup> .....	24
Biological Science <sup>2</sup> .....	10
Social Science <sup>3</sup> .....	32
Language & Arts .....	8
M.S. or P.E. ....	6
Basic Communications .....	9
Electives .....	7
	—
	96

During your Junior and Senior years you complete the following minimum requirements.

Course	Hours
Agricultural Economics .....	23
Economics .....	14
Business Administration .....	10
Agricultural Production .....	10
Department Prescribed Courses .....	15
Electives .....	24
	—
	96

<sup>1</sup>Exact Sciences requirements must be filled from the following courses or their equivalent: Math. 24, 25, 26, 35, 44 or 46, 97, 98 or 99; Physics 17, 18, and 19 or 20, 21, 22; Chemistry 3, 4, or 5 or 10, 11, and 12; Geology 3 or 31; Chemistry 31 and Physics 31.

<sup>2</sup>Biological Science requirements must be filled from the following courses: Botany 24, 25; Zoology 3, 4, 112; Bacteriology 70, 71; General Biology 1 and Physiology 4.

<sup>3</sup>Social Science requirements may be filled from any lower division courses in Agricultural Economics, Business Administration, Economics, History, Political Science, Psychology, or Sociology. Some course work must be taken in a minimum of four departments.

### Ag. Economics Courses

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

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

**\*\*105. Agricultural Credit.** Principles of agricultural credit. Emphasis on problems and methods of financing agriculture. (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. (3S) **Strong**

112. **Agricultural Cooperatives.** Principles of cooperation: organization, operation and management of cooperative sales, purchasing, and service associations. (3S) **Christensen**

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

**\*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. (4F, 4W) **Roberts**

150. **Special Readings.** Directed readings on selected problems for undergraduates. Credit arranged. (F, W, S, 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. (3F) **Morrison**

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

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. (3S) **Anderson**

**\*186. Land Problems and Appraisal.** The application of economic principles and techniques to the appraisal, conservation and development of land and water. (3S) **Strong**

202. **Advanced Farm Management.** Economic principles and their application to specific production functions in agriculture. (3F) **Davis**

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

235, 236, 237. **Student and Faculty Seminar.** Required of all senior and graduate majors. No credit. (F, W, S) **Staff**

\*Taught 1961-62.

\*\*Taught 1962-63.

**240. Research Methods.** Methods and techniques of doing research in Agricultural Economics. (3F) **Roberts**

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

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

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

## Department of

# Agronomy

(Agronomy, Crop Science, Soil Science, Soils and Irrigation)

PROFESSORS *Howard B. Peterson*, HEAD, *DeVere R. McAllister*, *Sterling A. Taylor*, *D. C. Tingey*; ASSOCIATE PROFESSORS *R. L. Smith*, *Golden L. Stoker*, *LeMoyne Wilson*; ASSISTANT PROFESSORS *Keith R. Allred*, *Wade G. Dewey*, *Raymond W. Miller*, *Rex F. Nielson*, *Gordon Van Epps*; EXTENSION AGRONOMIST *Louis A. Jensen*; EXTENSION SOIL SCIENTIST *Paul D. Christensen*; COLLABORATORS *John W. Carlson*, *John W. Cary*, *Douglas R. Dewey*, *Austin J. Erickson*, *Jay L. Haddock*, *Alvin C. Hull*, *Lester N. Leininger*, *Forrest V. Owen*, *Marion W. Pedersen*, *George K. Ryser*, *Clifton H. Smith*, *Merwin A. Stevens*, *Darrel M. Stuart*, *James P. Thorne*, *A. Lee Urie*, *Rollo W. Woodward*.

## Office in Agricultural Science 225

Study and research in Agronomy focus upon problems of crop production and soil conservation in arid regions. Course offerings emphasize inter-relations of plants, soil, precipitation, and irrigation water in production of maximum crop yields under a variety of conditions. Three types of majors for the bachelor's degree are offered: Agronomy, Crop Science, and Soil Science.

Majors must have a grade point of 2.5 or better in all Agronomy courses. Any Agronomy course with "D" grade must be repeated. Transfer students are required to take at least 15 credits of the major in residence at Utah State University.

## 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, soil physics, soil chemistry, soil fertility or plant nutrition, soil genesis, soils and irrigation, and agronomy. 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.

Upper division courses acceptable for graduate credit toward the Master of Science degree in Agronomy are: 109, 110, 120, 155, and 165; in addition, for transfer majors in Crops, 107.

*Doctor of Philosophy Degree.* The Department, in cooperation with related departments, offers the

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degree of doctor of philosophy in: soil physics, soil chemistry, soil fertility or plant nutrition, soil genesis, soils and irrigation, and irrigation and crop management. 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.)

### Agronomy

As a major in Agronomy you are prepared for positions in the Agricultural Extension Service; as an agronomist, farm planner, conservationist, and soil scientist in the United States Civil Service; or as field man or farm manager in the commercial field.

In addition to the general University group requirements you should take Ag. Econ. 71, 72, and 73 (nine hours, or the equivalent); Ag. Eng. 10 or 110; Agron. (Crops) 7, 8, 103, 109, 112, 118, and 120; Agron. (Soils) 106, 107, 111, 114, and 155; Animal Sciences six hours (three hours in each of two departments); Bact. 10, or 70 and 71; Bot. 24, 25, and 120 or 130; Chem. 10, 11, and 12; Ent. 108; Gen. Agric. 1; Geol. 3; Hort., three hours; Math. 24, 25, and 26, or Math 34, 35, and 44, or 46; and Zool. 112.

### Crop Science

As a major in Crop Science you are prepared to do graduate work or to take technical employment in research and teaching in crop production, plant breeding, weed control, and seed technology. If you have special aptitudes in the fundamental sciences and are interested in plant sciences you will find unlimited opportunities in this field.

In addition to the general University group requirements you should take Ag. Eng. 10 or 110; Agron. (Crops) 7, 8, 103, 109, 112, 118, and 120; Agron. (Soils) 106, 107, 111, and 155 or 165; Appl. Stat. 131 and 132; Bact. 70 and 71; 71; Bot. 24, 25, 30, 120, and 130; Ent. 108; Exact Science, 45 hours to be filled from the following courses: Math 35, 44 or 46, 97, 98, 99; Physics 17, 18, 19, or 20, 21, and 22; Chemistry 3, 4, 5, 12, 115 (under exceptional circumstances 10 and 11 may be authorized by the head of the department); Geol. 3; and any upper division Math., Chem., Physics, or Geol. courses authorized by your major department; and Zool. 112.

### Crops Courses

**7. Grain Crops.** The classification, history, and cultural methods involved in the production of grain crops. Two lectures, one lab. (3S) **Staff**

**8. Root and Miscellaneous Crops.** Cultural methods, market grades and commercial possibilities of sugar beets, potatoes, tobacco, and other crops are studied. (3W) **Allred**

**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. Prerequisite: Bot. 24. (4F, S) **Allred**

**109. Plant Breeding.** Principles, techniques, and practices in breeding improved varieties of crop plants. Prerequisite: Zool. 112. (5W) **Staff**

**112. Field Crops Seminar.** Review and discussion of Current Agronomic problems, practices, and available employment. Required of all seniors in department. One lecture. (1F) **Staff**

**118. Weeds.** Identification of weeds, the weed problems in agriculture, and methods of control. An assessment is made for field trips. Three lectures, one lab. (4F) **Thgey**

**120. Field Crop Seed Production.** Methods, problems, and commercial possibilities of field crop seed production in the Intermountain West. Prerequisite: Bot. 24. (2F) **McAlister**

**121. Seed Analysis and Grading.** Impurities of crop seeds; methods of analysis and testing; seed inspection; application of federal standards in the grading of field crops. Two labs. (2W) **McAllister**

**201. Hays and Pastures.** Recent advances in current problems related to the production and use of hays and pastures. Prerequisite: Agron. 103 or equivalent. (3W) **Allred**

**208. Advanced Field Crops.** Recent advances in the improvement and production of cereal, potato and sugar beet crops. Prerequisites: Agronomy 7 and 8. (3S) **McAllister**

**213. Crop Seminar.** Current scientific topics in farm crops. Required of all graduate majors. One conference weekly. (1F, 1W, 1S) **Staff**

## Soil Science

As a major in Technical Soils you are prepared for graduate work or employment in research, soil testing, land classification, and soil management. You will find real opportunities in this major if you achieve high scholastic standing and have a marked ability in the fundamental sciences.

In addition to general University group requirements you should take Ag. Eng. 10 or 110; Agron. (Crops) 7 or 8, 103, 112, Agron. (Soils) 106, 107, 111, 114, 155 and 165; Appl. Stat. 131 and 132; Bact. 70 and 71; Bot. 24, 25, and 120; Chem. 3, 4, 5, and 115; Geol. 3; Math. through 99; Physics 17, 18 and 19, or 20, 21 and 22; plus five hours of either Organic Chemistry or advanced Physics. A minimum of 63 hours in mathematics, physics and chemistry are necessary to meet the minimum approved by the Soil Science Society of America.

## Soils Courses

**56. Introductory Soils.** A terminal survey course. A brief study of soil formation, classification, fertility and management. Three lectures, one lab. (4W, S) **Staff**

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

**58. General Soils.** Fundamentals of soils with emphasis on range and forest soil problems. Designed for students in forestry and range management. Prerequisite: Inorganic Chemistry (Credit not given for both 56 & 106 and 58.) Four lectures, one lab. (5S) **Miller**

**106. Fundamentals of Soil Science.** A study of the composition and reactions of mineral soils; physical and chemical soil properties. A beginning course for students in Agricultural sciences. Three lectures, one lab. For students in applied science, should be taken in a sequence with Agron. 107. Prerequisites: Math. 35 and Inorganic Chemistry. (4F) **Miller**

**107. Fertility and Management of Irrigated Soils.** Application of soil principles to management practices of soils including water-soil relations, organic matter maintenance, fertilizers, and reclamation and management of saline soils. Prerequisite: Agron. 58, or 106, or approval of the instructor. (5F or W) **Staff**

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

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

**114. Soil Survey and Conservation.** A study of soil forming factors and of soil classification, survey, and conservation. Prerequisite: Agron. 106 or 58 and 3 credits in field crop production or range management. Two lectures, three labs. (5S) **Miller**

**155. Soil and Plant Relations.** Plant and soil relations with respect to physical environment and the availability and absorption of minerals. Laboratory in soil and plant analysis in relation to soil productivity. Prerequisite: Agron. 106 or 58. For seniors. Two lectures, one lab. (3W) **Peterson**

**165. Physical Edaphology.** The physical relationships of soil moisture, temperature, penetrability, and aeration to plant growth. Mineralogical composition, structural conditions, tillage, irrigation, and other soil management practices are considered as factors that affect these relationships. Prerequisites: Agron. 107, General Physics or Chemistry. (3F) **Taylor**

**212. Seminar.** Review of current literature in soil science. Required of all graduate majors. (1F, 1W, 1S) **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: Agronomy 165. (3S) **Taylor**

\*\*Taught 1962-63.



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

\*221. **Genesis, Morphology and Mineralogy of Soils.** A critical review of basic principles of soil classification, soil forming factors in relation to generic, morphological and zonal distribution of soils. Prerequisite: Agron. 114. (3F) **Miller**

\*224. **Soil Chemistry.** Composition and reactions of soil colloids. (3S) **Smith**

\*\*227. **Chemical Analysis of Soils.** A laboratory course in soil chemistry. Two lab periods. Prerequisite: Agron. 155 and 224. (2W) **Miller and Smith**

266. **Physical Analysis of Soils.** A laboratory course in Soil Physics. Prerequisite: Agron. 165. (2F) **Taylor**

\*Taught 1961-62.

\*\*Taught 1962-63.

## Special Courses

116. **Dry Farming.** Principles of dry farming from practical and scientific standpoints; a survey of agricultural work in the Great Plains and the mountain regions; and analysis of the possibilities in typical climatic areas and on important soil types. Prerequisites: Agron. 7 and 106. (2S) **McAllister**

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

218. **Special Problems.** Crop production, crop breeding, soil fertility, or other phases of agronomic work. You review literature on the problem and conduct experiments. Credit arranged. (F, W, S, Su) **Staff**

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

## Department of

# Animal Husbandry

PROFESSORS *James A. Bennett*, HEAD, *Lorin E. Harris*, *George R. Henderson*; ASSOCIATE PROFESSORS *John E. Butcher*, *Russell R. Keetch*, *Milton A. Madsen*, *Darrel H. Matthews*, *Doyle J. Matthews*, *Hyrum Steffen*<sup>1</sup>; ASSISTANT PROFESSORS *Warren C. Foote*, *Joseph C. Street*; RESEARCH ASSOCIATE *David O. Williamson*; RESEARCH ASSISTANT *Milo Dew*.

## Office in Animal Industry 307

Courses in Animal Husbandry are designed to train you to solve problems encountered in producing beef cattle, sheep, and swine.

As a major in Animal Husbandry you may obtain a Bachelor of Science degree in either General Animal Husbandry or an Applied Science Program of study. A two-year certificate course in Animal Husbandry is also offered.

A major in General Animal Husbandry will prepare you to be a livestock operator, a ranch man-

ager, a county agent, or to take a position related to livestock raising with various other state and federal agencies.

## Suggested Course of Study

FRESHMAN		Credit
Course		
A.H. 2, 50	.....	3
Math. 24, 25, 26 or 34, 35 and 44 or 46	9 or 11	
M.S. or P.E.	.....	3
English 1, 2, and 3	.....	9
Ag. Econ. 71, 72 and 73	.....	9
P.S. 10	.....	5
Zool. 3	.....	5
Agric. 1	.....	1
Electives	.....	4 or 2
		48

<sup>1</sup>On leave.

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### SOPHOMORE

Course	Credit
A.H. 41, 42 .....	2
Chem. 10, 11 and 12 or 3, 4 and 12.....	15
M.S. or P.E. ....	3
Botany 24, Zool. 4 or Bot. 25, Bot 30.....	15
V.S. 20 .....	5
Agron. 56 .....	4
Lang. and Arts .....	5
	—
	49

### JUNIOR

Course	Credit
A.H. 150, 151, 152, 155, 165 .....	17
Zool. 112 .....	5
Dairy or Poultry .....	3
Agron. 103 .....	4
Irrigation and Drainage 10 or 110.....	3
Surveying 81 .....	3
Lang. and Arts .....	3
Electives .....	10
	—
	48

### SENIOR

Course	Credit
A.H. 110, 125, 160, 175 .....	12
Entomology 108 .....	5
Ag. Educ. 151 .....	3
Business 20 or 147, 63 .....	8
V.S. 120, 150 .....	7
Range Mgt. 160 .....	6
Electives .....	7
	—
	48

*Applied Science in Animal Husbandry.* Majoring in this field you will be prepared for graduate work or technical employment in research. If you have high scholastic standing and marked ability in the fundamental sciences you find excellent employment opportunities in this major.

### Applied Science Curriculum

During the freshman and sophomore year, you should complete the following requirements: Exact sciences, a minimum of 45 hours to be selected from Math. 35, 44, 46, 97, 98, 99; Physics 17, 18, 19 or 20, 21, 22; Chemistry 3, 4, 5, 12, 115; Biological sciences, a minimum of 15 hours to be selected from Botany 24, 25; Zoology 3, 4; Bacteriology 70, 71; Language and

Arts, eight hours to fill the University group requirement; Social Sciences, eight hours to fill the University group requirement; English 1, 2 and 3, nine hours; P.E. or M.S., six hours.

In addition, the following courses should be completed: Agric. Econ. 163, 180 or the equivalent; Agron. 56, 103, or Range Man. 160; An. Hus. 2 or 165, 50, 41, 42, 150, 151, 155, 160; Chemistry 190; V. S. 20, Zool. 112.

If you specialize in nutrition you should also complete either Physiology 121 and 122 or Chem. 121, 122 in addition to Chem. 3, 4, 5, and 115.

### Two-year Program in Animal Husbandry

A two-year practical course is available to train you for efficient livestock production. If you do not wish to take more than two years of University work, the suggested course of study is as follows:

A.H. 2; 10; 41, 42 and 50 or 120; 110, 125 .....	16
V.S. 120 .....	4
Agron. 56, 103 or Rge. Mgt. 160. ....	8
Ag. Econ. 71, 72, 73 .....	9
Ag. Eng. 1, 10, 102, 103 .....	19
Welding 91 .....	5
English 1, 2, 3 .....	9
Math. 34 .....	3
P.S. 10, Soc. 10 or 70 .....	10
P.E. and Electives .....	13
	—
	96

### Graduate Study

*Master of Science Degree.* The Animal Husbandry Department offers the Master of Science degree in Animal Production, Animal Breeding and Animal Nutrition. In cooperation with other departments a Master of Science degree is offered in Animal Nutrition and Biochemistry. (See Interdepartmental Curriculum in Animal Nutrition and Biochemistry.)

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*Doctor of Philosophy Degree.* The Animal Husbandry Department in cooperation with related departments offers the Doctor of Philosophy degree. (See also Interdepartmental Curriculum in Animal Nutrition and Biochemistry.) Detailed information may be obtained from the Department or from the Dean of the School of Graduate Studies.

### Animal Husbandry 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) **Footo**
- 2. Animal Husbandry Laboratory.** Exercises in judging, marketing classification and practical problems. Should be taken at the same time as A.H. 1. Two labs. (2F) **Madsen**
- 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) **Footo**
- 41 and 42. Livestock Practicum.** Development of skills in the feeding, care, fitting and showing of beef cattle, sheep and swine. Two labs. (1W, 1S) **Staff**
- 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) **Staff**
- 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: A.H. 152. (3F) **Staff**
- 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: A.H. 152. (3W) **Bennett**
- 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: A.H. 152. (3S) **Matthews**
- 150, 151. Animal Nutrition.** Basic principles of the metabolism of nutrients and nutrient requirements of farm animals; nutritional diseases; and a consideration of investigational methods. Prerequisite: Chemistry 12. (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: A.H. 151 (3S) **Butcher**
- 155. Animal Breeding.** Application of genetics to improvement of farm animals. Breeding systems, inheritance problems, fertility and sterility in larger farm animals. Prerequisite: Vet. Sci. 20, Zool. 112. Four lectures, one lab. (5S) **Bennett**
- 160. Livestock Production Problems.** Attention is given various problems in livestock production, especially in Utah. Prerequisite or concurrent registration: A.H. 152 and 155. (3S) **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: A.H. 2. Three labs. (3F) **Matthews**
- 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: A.H. 125. (3S) **Madsen**
- 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**
- 201. Problems in Animal Breeding.** Readings, discussions and lectures concerning genetic facts and theories as related to animal breeding. Prerequisite: A.H. 155. (3W) **Bennett**
- 210. Techniques in Nutrition Research.** An original project is completed with the primary objective being to orient you on how to plan, conduct, and summarize research in animal nutrition. Prerequisite: A.H. 150. (2-6F, W or S) **Harris**

## Applied Statistics 43

**\*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: A.H. 150. (3W) **Harris**

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

**220. Problems in Animal Production.** Same as A.H. 210, except work is in animal production. Prerequisite: A.H. 160. (2-6F, W, or S) **Madsen**

**230. Animal Breeding Research.** You outline a problem, make a critical review of pertinent literature, collect, analyze necessary data, and prepare a report of your research. This work may be the thesis material for the M.S. degree, or may be done for graduate credit apart from the thesis. (2-5F, W or S) **Bennett**

**240. Animal Nutrition Research.** Same as A.H. 230, except that research is in some

phase of animal nutrition. (2-5F, W or S) **Harris**

**250. Animal Production Research.** Same as A.H. 230, except that research is in some phase of animal production aside from breeding or nutrition. (2-5F, W or S) **Madsen**

**261, 262, 263. Animal Industry Seminar.** Topics of current interest and research problems are presented by graduate students, staff members and guest speakers. Subjects discussed relate to nutrition, breeding, and production. (May be repeated.) (1F, 1W, 1S) **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, 1W, 1S) **Staff**

\*Taught 1961-62.

### Department of

## Applied Statistics

PROFESSOR *Rex L. Hurst*, HEAD; ASSISTANT PROFESSOR *Neeti R. Bohidar*.

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Statistics is the science which deals with the making of decisions in the face of uncertainty. Statistics is used extensively as a tool by research workers with which to summarize large masses of data and to reach valid conclusions based on the summarization process. It is used by research workers in many fields of endeavor. It relies heavily on the use of mathematics for the development of reduction procedures, for procedures involving testing of hypotheses, and for the formulation of mathematical models to simulate physical and biological situations.

A major in Applied Statistics prepares you to go on for graduate work in the many universities of the nation where graduate pro-

grams are established. You as an Applied Statistics major are prepared to accept positions as a member of a research team in business, manufacturing concerns, research organizations, and agriculture experiment stations. There are unlimited opportunities for outstanding employment and professional advancement.

For a major in Applied Statistics you are expected to complete Applied Statistics 131, 132, 156, 141, 220, and 215. You are also expected to take extensive work in the Mathematics Department. A minimum of 13 credit hours in the division of mathematical statistics is required. It is advisable that you, as a major in Applied Statistics, have a strong minor in one of the fields

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of application. An under-graduate minor in Applied Statistics should consist of Applied Statistics 131, 132, 141, 215, and either 156 or 220.

### Suggested Four-year Curriculum

#### Freshman and Sophomore Years

	Credit hours
Basic Communications (1, 2, 3) .....	9
Mathematics (35, 46, 97, 98, 99) .....	25
Biological Science (Bot. 24, 25; Zool. 3, 4; Bact. 10 or 70, 71) .....	15
Chemistry .....	15
Language <sup>1</sup> (Russian 1, 2, 3; German 1, 2, 3; French 1, 2, 3) .....	15
M.S. or P.E. ....	6
Economics (51) .....	5
Political Science (1 or 10) .....	5
Electives .....	4
Total .....	99

#### Junior and Senior Years

	Credit hours
Physics (17, 18, 19 or 20, 21, 22) .....	15
Applied Statistics (131, 132, 156, 141, 220, 215) .....	21
Mathematical Statistics .....	13
Electives .....	50
Total .....	99

<sup>1</sup>Other University requirements for the Language and Arts group may be substituted if approved by the department.

### Applied Statistics 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: Mathematics 85 or equivalent. Three lectures, one lab. (4F) **Staff**

**131. Statistical Methods.** Sample-based inferences about populations. Individual and group comparisons. Tests of significance. Linear regression and correlation. Prerequisite: Mathematics 35 or equivalent. Three lectures, one lab. (4F) **Bohidar**

**132. Statistical Methods.** Analysis of variance and covariance. Individual degrees of freedom. Multiple regression. Prerequisite: Applied Statistics 131 or equivalent. Three lectures, one lab. (4W) **Bohidar**

**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. Prerequisite: Applied Statistics 131 or equivalent. Three lectures. (3S) **Hurst**

**156. Data Processing on Electric Accounting Machines.** Adapting research data to mechanical processing. Card design; coding methods; experimental design; analysis of enumeration and measurement data. Prerequisite: Applied Statistics 131 and 132 or equivalent. Two lectures, one lab. (3W) **Hurst**

**215. Design of Experiments.** Fundamental principles of experimental design. Completely randomized; randomized blocks; latin squares, components of error; factorial arrangements; confounding; split plot; incomplete block designs; and fractional replication. Prerequisite: Applied Statistics 131 and 132 or equivalent. Three lectures, one lab. (4S) **Bohidar**

**220. Advanced Applied Statistics.** Introductory theory and application of methods of maximum likelihood and least-squares, discriminatory analysis, probit analysis, casual system (path) analysis, sequential analysis and linear programming. Prerequisite: Applied Statistics 131 and 132 or permission of instructor. Three lectures. (3W) **Hurst**



Department of

# Botany and Plant Pathology

PROFESSORS Orson S. Cannon, HEAD, W. S. Boyle, George W. Cochran; ASSOCIATE PROFESSORS Arthur H. Holmgren, Herman H. Wiebe; ASSISTANT PROFESSORS Gene W. Miller, Richard J. Shaw, George H. Welkie; RESEARCH ASSOCIATE John L. Chidester; COLLABORATORS Walter J. Apt, Eugene H. Cronin, Edsel C. Jorgenson, Mark W. Martin, Myron Stout, Bryce N. Wadley, M. Coburn Williams.

## Office in Plant Industry 201

Study and research in Botany focus upon four major fields: Cytogenetics, Pathology, Physiology, and Taxonomy. Course requirements for the Bachelor of Science degree in Botany include: Botany 24, 25, 30, 116, 117, 120, 130, 240; Chemistry 3, 4, 5, (under exceptional circumstances 10 and 11 may be authorized by your adviser); Math. 35; Zool. 112. Required additional courses for the various fields of Botany are: *Cytogenetics*: Botany 118, 150; Chem. 121, 122; Zool. 3, 4, 131; *Plant Pathology*: Botany 150; Chem. 121, 122; Ent. 108; Zool. 3; *Taxonomy*: Agron. 56; Botany 118, 150; Range Management 126; Zool. 107, 131, 214.

Recommended additional courses for specialized fields include: *Cytogenetics*: Chem. 190; Physics 140. *Plant Pathology*: Agron. 56; Applied Statistics 131, 132; Bact. 70, 71; Ent. 230; Hort. 131; Math. 46, 97, 98, 99; Physics 17, 18, 19; *Plant Physiology*: Agron. 106; Botany 150, 224; Chem. 101, 115, 121, 122; Math. 46, 97, 98, 99; Physics 17, 18, 19, 140; Physiology 130; Zool. 3, 4; *Taxonomy*: Applied Statistics 131, 132; Botany 108, 112; German 1, 2, 3; Latin 1, 2, 3.

## 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, Taxonomy. 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 Department of Agriculture, and the Intermountain Herbarium.

As a candidate you must submit a thesis on a topic within the field of your major subject. The thesis alternate, "Plan B," is not acceptable for 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 Physiology, Virology and the Interdepartmental Curriculum in Plant Nutrition and Biochemistry. For detailed information see "School of Graduate Studies." Detailed information may be obtained from the Department.

## Herbarium

The Intermountain Herbarium was established in 1932. Its function is largely to serve as the repository of plant materials obtained

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by field exploration, gifts, and exchanges with other institutions—materials that constitute the basis upon which the rich native vegetation of Utah and the Intermountain Region is receiving scientific, economic, and popular investigation and descriptive treatment. The results of the researches are published as technical articles in scientific journals and economic and popular bulletins and circulars released by the USU Agricultural Experiment Station. Most plant species that grow in Utah and the Intermountain Region are represented in the Herbarium.

Graduate study in plant taxonomy offered by the Department of Botany and Plant Pathology utilizes the extensive facilities of the herbarium.

The facilities are available, by arrangement with the Curator, for consultation and research by qualified members of the University staff, students, collaborating agencies, institutions and members of the community.

Identification of and information concerning native or introduced plants are provided by the herbarium staff. Requests for information or plant identification should be addressed to the Curator of the Herbarium.

### Botany and Plant Pathology Courses

**1. Principles of Biology.** Basic life principles illustrated in both plant and animal forms. See lower division group requirements. (5F, S)

Shaw

**24. Elementary Botany.** The structure, physiology, and reproduction of flowering plants. Consideration given to basic structure and functions of cells, tissues, stems, roots, leaves, flowers, fruits, and seeds. Three lectures, two labs. (5F, S)

Boyle, Shaw

**25. Elementary Botany.** A survey of the plant kingdom. Emphasis on comparative

morphology and reproductive processes of representatives of the major groups of plants. Introduction to the classification of the vascular plants. Three lectures, two labs. (5W)

Boyle, Shaw

**30. 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. (5S).

Holmgren, Shaw

**\*104. Evolution of Cultivated Plants.** Origin, evolution and distribution of certain selected plants which are of economic importance to man. Prerequisites: Bot. 25, 30, Zoo. 112 or equivalent. Lectures, readings and student reports. (3W)

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. (4W)

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; theory and use of the microscope. Assumes a knowledge of fundamental principles of botany. (4W)

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 relationships to genetic phenomena. The laboratory emphasizes plant materials. Assumes a knowledge of fundamental principles of Botany or Zoology. Two lectures, two labs. (4S).

Boyle

**120. Elementary Plant Physiology.** The principal physiological processes of plants, including water relations, synthesis and use of foods, and growth phenomena. Prerequisites: Botany 24 and Chem. 12. (Chem. 12 may be taken concurrently.) Three lectures, two labs. (5W, S)

Wiebe

\*Taught 1961-62.

\*\*Taught 1962-63.

**\*\*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: Bot. 120. (3W) **Wiebe**

**\*\*125. Morphology of Vascular Plants.** Structure, development, reproduction, and evolution of the classes and orders of vascular plants. Prerequisites: Botany 24, 25, and 30. Three lectures, two labs. (5W) **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: Botany 24, 25, and 130, or one quarter of plant ecology. Three lectures, one lab. (4W) **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 indus-

try. Prerequisite: Bot. 25. Three lectures, two labs. (5W) **Cannon**

**\*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. Prerequisites: Botany 24, Chem. 12, and Bot. 120. Two lectures, two labs. (4F) **Miller**

**226. Plant Virology.** Physical and chemical properties of viruses and their biological relationships. Prerequisite: Botany 120. (3S) **Welkie**

**234. Special Problems.** Individual instruction. Credit arranged. (F, W, S, Su) **Staff**

**240. Seminar.** (1F, 1W) **Staff**

**250. Research.** Conduct special research in plant cytology, pathology, physiology, or taxonomy. Individual instruction. Credit arranged. (F, W, S, Su) **Staff**

\*Taught 1961-62.

\*\*Taught 1962-63.

## Department of

# Dairy Industry

(Dairy Production and Dairy Manufacturing)

PROFESSORS *George E. Stoddard*, HEAD, *George Q. Bateman*, *A. J. Morris*, EMERITUS; ASSOCIATE PROFESSOR *Paul B. Larsen*; ASSISTANT PROFESSOR *R. C. Lamb*; INSTRUCTOR *Theodore R. Kowallis*; RESEARCH ASSOCIATE *Charles H. Mickelsen*; RESEARCH ASSISTANT *LaMon Perkes*.

## Office in Animal Husbandry 101

The courses in Dairy Industry offer a general curriculum for a bachelor of science degree, and an applied science or biological curriculum if you plan to continue toward a graduate degree.

All majors in Dairy Industry must have practical experience on a dairy farm or in a dairy manufacturing plant before graduation with a bachelor of science degree.

## Graduate Study

The Dairy Industry Department offers a Master of Science degree in Dairy Production and in Dairy Manufacturing. The Master of Science degree is acceptable by other universities toward further study on a PhD degree. You may work on a Master of Science or a PhD degree in the Animal Nutrition and Biochemistry Interdepartmental Curriculum.

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### Dairy Production

*General Curriculum.* Designed for a major in Dairy Production to prepare you for the management and operation of dairy farms and herds; or to become a county agricultural agent or a fieldman in the dairy industry.

You must fill the general requirements of the University and College of Agriculture. The following courses are also required: Dairy 6, 110, 111, 112, 120, 121, 122, and at least three quarters of 215; Zoology 3, 4, 112; Botany 24; Math. 35; Bacteriology 10 or 70 and 104; Chemistry 10, 11, 12; Veterinary Science 20, 120; Animal Husbandry 150, 151, 152; Agricultural Economics 71, 72, 73; Agronomy 56, 103; Agricultural Engineering 10 or 110.

The following courses are recommended: Physics 6, Veterinary Science 150; Agronomy 7, 118; Animal Husbandry 155; Agricultural Engineering 101; Agricultural Economics 102, 103; Entomology 108; Business Administration 20.

*Biological Science Curriculum.* Designed for a major in Dairy Production to prepare you for technical employment in dairy production and for advanced study, teaching and research in this field.

You must fill the general requirements of the University and the College of Agriculture. The following courses are also required: Dairy 6, 110, 111, 112, 120, 121, 122, and at least three quarters of 215; Zoology 3, 4, 112; Botany 24; Math. 35, 44; Bacteriology 70, 104; Chemistry 3, 4, 5, 190; Physics 6; Veterinary Science 20, 120; Animal Husbandry 150, 151, 152, 155; Agricultural Economics 71, 72, 73; Agronomy 56, 103; Agricultural Engineering 10 or 110.

In preparation for advanced dairy production you may specialize in one of three areas: (1) nutrition, (2) breeding or (3) physiology. If you specialize in one of these areas you will be required to take the courses indicated for each in addition to the above courses: (1) nutrition—Chemistry 115, 121, 122 and 190; (2) breeding—Chemistry 12; Applied Statistics 131, 132; Zoology 111 or 131; (3) physiology—Chemistry 115, 121, 122 and 190; Physiology 121, 122, 141; Zoology 118.

### Dairy Manufacturing

*General Curriculum.* This course will prepare you for commercial dairying to be a plant operator, an equipment and supply technician, a grader, or a sanitarian.

In addition to the general University and College of Agriculture requirements you will be required to take: Chemistry 190, 108; Bacteriology 104, 105; Business Administration 20, 63, 170; Dairy Industry 5, 6, 101, 102, 103, 104, 105, 110, 215, 254.

*Business Course in Dairy Manufacturing.* This course will prepare you to be a plant manager, a salesman, or a dairy industry administrator.

In addition to the general University and College of Agriculture requirements, you will be required to take: Bacteriology 104, 105; Business Administration 20, 63, 100, 156, 170, 171; Dairy Industry 5, 6, 101, 102, 103, 104, 105, 110, 215, 254.

*Applied Science Course in Dairy Manufacturing.* This course is taken in technical preparation for teaching, research and quality control. In addition to the general University and College of Agriculture

ture requirements, you will be required to take: Chemistry 3, 4, 5, 17, 18, 108, 121, 122, 190; Bacteriology 104, 105, 180; Applied Statistics 51; Physics 6; Math. 35, 44, Business Administration 63, 170; Dairy Industry 5, 6, 101, 102, 103, 104, 105, 110, 121, 215, 254.

## 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 feeding. 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) **Morris, Lamb**

**5. Judging Dairy Products.** Methods and practice in judging and grading dairy products for market and show. (2S) **Staff**

**6. Market Milk.** Modern sanitary methods of producing, processing and marketing milk, cream, and related products. (5F) **Staff**

**\*101. Manufacture of 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, and freezing of standard commercial ice cream, sherbets, and ices. Merchandising and selling included. (5S) **Morris**

**\*102. Manufacture of Butter.** Receiving and grading of milk and cream. Manufacture, packing, and grading of butter under commercial conditions. Quality and composition control are emphasized. (4W) **Staff**

**\*\*103. Manufacture of Cheese.** Factors involved in making cheddar and other varieties of cheese. Classification, statistics, curing, marketing, and factory organization. (5F) **Morris**

**\*\*104. Concentrated Milks.** Theory and practice of manufacture of evaporated sweetened condensed milk powder and other concentrated milk products. Consideration is given to plant processes, vacuum pan and drier operation, factors affecting quality and use. (5W) **Staff**

**105. Management and Operation of Dairy Manufacturing 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. (6F, W, S) **Morris**

**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. (4S) **Lamb**

**111. Dairy Cattle Judging and Evaluations.** Types of various breeds of dairy cattle, judging individual cows, showing, judging and type classifications, type and production relations. Visits to dairy farms. (2S) **Lamb**

**112. Feeding Dairy Cattle.** Characteristics of standards and feeding systems. Economy and comparative value of feeds on irrigated farms. Prerequisite: A.H. 150. (3W) **Stoddard**

**120. Dairy Cattle Breeds and Breeding.** Studies of the inherited characteristics of dairy cattle to be considered in selecting breeding stock. Artificial insemination of dairy cattle, 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: Zool. 112. (5W) **Lamb**

**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. (3S) **Stoddard**

**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.) (3S) **Stoddard**

**215. Seminar.** Discussions and reports of current literature and research reports by students. At least three quarters required of all dairy students. (1F, 1W, 1S) **Staff**

**220. Research in Dairy Industry.** Credit arranged. (F, W, S, Su) **Staff**

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

**Nutrition and Biochemistry Seminar.** (See Animal Husbandry 270.)

\*Taught 1961-62.

\*\*Taught 1962-63.



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### Department of

# Horticulture

(Floriculture, Food Technology, Pomology, Vegetable Crops)

PROFESSORS *Leonard H. Pollard*, HEAD, *Alvin R. Hamson*; ASSOCIATE PROFESSORS *D. K. Salunkhe*, *David R. Walker*; ASSISTANT PROFESSOR *Robert K. Gerber*<sup>1</sup>; INSTRUCTOR *Otto Riethmann*; EXTENSION HORTICULTURIST *Anson B. Call*; SUPERINTENDENT OF HOWELL FIELD STATION *Odeal C. Kirk*; SUPERINTENDENT OF FARMINGTON FIELD STATION *Rulon Draper*; COLLABORATOR *Leslie R. Hawthorn*.

### Office in Ag Science 204

The field of horticulture includes the production, marketing and utilization of fruits, vegetables, and ornamental crops and the processing of fruits and vegetables. The department offers two curricula, General Horticulture and Horticultural Science with specialization in floriculture, food technology, pomology, or vegetable crops in either the science or general curriculum.

### General Horticulture

The general horticulture curriculum prepares you for a position as an agricultural extension agent, civil service agent, industrial agricultural representative, or agricultural inspector. Other positions depending on the option selected include farm manager, park and gardens supervisor, and a number of jobs in the nursery, florist, marketing, processing, seed, fertilizer and chemical industries.

In addition to the University and College of Agriculture requirements you should take the following courses to satisfy department requirements for a BS degree: Agron. 56 or 106; Bact. 10 or 70, 71; Bot. 24, 25, 120 and 130; Chem. 10, 11, and 12; Ent. 108; Hort. 1, 2, 4, 11, 131, 153 and department

prescribed courses depending on specialization; Math 35 and 44 or 46; and Zool. 112.

### Horticultural Science

The horticultural science curriculum prepares you for graduate study, research and teaching and the more technical positions in the commercial fields indicated in the general curriculum. For a BS degree in this curriculum you should take the following courses in addition to University and College of Agriculture requirements: Agron. 106; Appl. Stat. 131 and 132; Bact. 70 and 71; Bot. 24, 25, 120 and 130; Chem. 3, 4, 5, 115, 121 and 122; Eng. 111; Ent. 108; Hort. 1, 2, 4, 11, 131, 153 and department prescribed courses depending on specialization; Math 35, 44 or 46, 97, 98 and 99; Physics 17, 18, 19 or 20, 21 and 22; and Zool. 112.

### Graduate Study

The Department offers work both for the Master of Science and Doctor of Philosophy degree in Horticulture in the areas of plant breeding and physiology. The outline of studies and the research program are adapted to the objectives of the individual student. The general re-

quirements for these degrees are explained in the School of Graduate Studies. (Also see Catalog, School of Graduate Studies.)

If you are interested in working toward an advanced degree, you should first contact the Head of the Department. He will study your qualifications and interests and recommend an advisor who will assist you in your course work and research program.

## Horticulture Courses

**1. Fruit Production.** Principles and practices underlying production of trees and small fruits. Varieties, soils, sites, fertilizers, culture, pest control, harvesting, storage propagation and stocks. Three lectures. (3F)

Walker

**\*2. General Horticulture Lab.** Required for horticulture majors, optional for others. Field trips and laboratory study on operation of horticultural enterprise including: varieties of fruits and vegetables, visits to fruit and vegetable markets, agricultural chemical distributors, commercial fruit and vegetable growers, processing plants and other allied industries. Students will pay moderate cost of travel. (2F)

Walker, Hamson

**4. Vegetable Production.** Principles and practices underlying production of vegetable crops, varieties, fertilizers, pest control, harvesting, storage, and processing of vegetables. Three lectures. (3S)

Hamson

**\*\*11. Garden Flowers.** Principles and practices of growing garden flowers, other ornamentals, and house plants. Two lectures, one lab. (3S)

Riethmann

**100. 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. Special emphasis is placed on fruit trees, but the small fruits and ornamental trees and shrubs are also included. (2W)

Walker

**\*\*101, 102. Advanced Horticulture.** Fundamental principles relating to horticultural practices; growth and development, nutrition, water relations, temperature, light, fruit setting, and growth regulators. Course 101 deals primarily with vegetable crops and 102 with fruit crops. These courses may be taken separately or in any sequence. Prerequisite: Bot. 24, 25 (Bot. 120 may be taken concurrently); Chem. 12 or 121; Agron. 106; Hort. 1 or 4. Three lectures, one lab. (4W, 4S)

Hamson, Walker

**\*116. Greenhouse Management.** Principles and practices of greenhouse management. Prerequisite: Hort. 11; Bot. 24, 25. (3W)

Riethmann

**118. Flower Arranging.** Basic principles of design associated with techniques of flower arranging including handling, care and conditioning of flowers. Training will be given in vase, basket, table, dry and Christmas arrangements, and construction of corsages. Emphasis is given on modern design. A modest laboratory fee will be required for the purchase of materials for making flower arrangements. Two lectures, one lab. (3F)

Riethmann

**\*\*119. Systematic Floriculture.** Systematic study of garden flowers. Prerequisites: Hort. 11; Bot. 30, 120. Systematic study of plants grown by florists. Two lectures, one lab. (3F)

Riethmann

**\*\*122. Nursery Management.** Propagation and culture of ornamental nursery stock including shrubs, trees, and evergreens. Two lectures, one lab. (3W)

Riethmann

**\*\*130. Vegetable and Flower Seed Production.** Methods and commercial possibilities of vegetable and flower seed production. A required field trip is taken into seed-producing areas in southern Idaho. Three lectures, one lab. (4F)

Pollard

**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 Department of Botany and Plant Pathology, Horticulture, and Zoology, Entomology, and Physiology. Prerequisites: Bot. 130, Ent. 108 or special permission. Three lectures, two labs. (5S)

Cannon, Davis, Walker

**\*139. Food Technology I.** Storage and transportation of horticulture crops. Will give emphasis to post harvest physiology and storage diseases of fruits and vegetables. Will include discussions of hydrocooling, air control, antibiotics, radiations, transportation, and distribution. Prerequisites: Bact. 10 or 70 and 71; Chem. 3, 4, 5, or 10, 11, 12; Bot. 24, 25, 130; Hort. 1, 4; or special permission. Three lectures, one laboratory. (4F)

Salunkhe

**\*\*140. Food Technology II.** Processing of horticultural crops. History and methods of commercial preservation of fruits and vegetables.

\*Taught 1961-62.

\*\*Taught 1962-63.

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tables by canning, freezing, drying, pickling, and radiations, juices, concentrates, and syrups; packaging, organoleptic appraisal, quality control, and sales promotion. Prerequisites: Bact. 10 or 70 and 71; Chem. 3, 4, 5, or 10, 11, 12; or by special permission. Three lectures, one laboratory. (4F)

Salunkhe

**153. Seminar.** Oral and written reports on research papers and original work by students. Required for all seniors. (1F, 1W, 1S) Staff

**156. Special Problems.** Advanced problems in floriculture, food technology, pomology and vegetable crops for qualified seniors or graduate students. Assigned reading, or research work in library, laboratory, or field presented as term papers. Registration by permission only. (1-3, F, W, or S) Staff

**201. Research and Thesis.** Original research by graduate students taking a major or minor in horticulture. Registration by permission only. (1-10, F, W, S) Staff

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

**\*\*220. Advanced Breeding.** A study of special techniques and practices used in the breeding of horticultural crops. Prerequisite: Hort. 115. (3W) Pollard, Hamson

**\*221. Evaluation of Horticultural Research.** A critical evaluation of published material and methods of compiling and presenting data. Registration by permission only. Prerequisites: Hort. 101, 102; Agron. 107; Bot. 120; Applied Stat. 131, 132. (4W) Staff

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

\*Taught 1961-62.

\*\*Taught 1962-63.

### Department of

## Poultry Husbandry

PROFESSORS *Carroll I. Draper*, HEAD, *Jay O. Anderson*; ASSOCIATE PROFESSORS *J. David Carson*, *Don W. Thomas*; ASSISTANT PROFESSORS *C. Elmer Clark*<sup>1</sup>, *Donald C. Dobson*; RESEARCH ASSOCIATE *Sherwin Atkinson*; RESEARCH ASSISTANT *Robert Warnick*.

### Office in Animal Industry 203

For a major in Poultry Husbandry you are expected to complete 30 credits of work in Poultry Husbandry. In addition to the courses listed under Poultry Husbandry, courses that will also count toward a Poultry major are Veterinary Science 120; Animal Husbandry 150; Zool. 112; and Chemistry, 155 and 190.

### Graduate Study

The Department offers a Master of Science degree in Poultry Nu-

trition, in Poultry Breeding and in Poultry Management.

### Suggested Course of Study

FRESHMAN		
Course		Credit
Physiol. 4	.....	5
Poul. Hus. 1	.....	5
Math 35	.....	5
M.S. or P.E.	.....	3
Bact. 70	.....	5
Zool. 3	.....	5
Vet. Sci. 20	.....	5
Eng. 1, 2, 3	.....	9
Rural Soc. 10	.....	5
Electives	.....	5

<sup>1</sup>On leave.

## Poultry Husbandry 53

### SOPHOMORE

Course	Credit
Zool. 4 .....	5
Chem. 3, 4, 12, or 10, 11, 12 .....	15
Agron. 56 .....	4
M.S. or P.E. ....	3
Soc. Sci. ....	3
Ag. Econ. 71, 72, 73 .....	9
L.A. 3 .....	3
Electives .....	8
	—
	50

### JUNIOR

Course	Credit
Chem. 190 .....	3
Lib. Sci. 50 .....	1
Zool. 112 .....	5
Poul. Hus. 126, 107, 105 or 106, 104 .....	7-9
Vet. Sci. 120 .....	4
A.H. 150 .....	3
Electives .....	22-20
	—
	45

### SENIOR

Course	Credit
Physiology 121, 122 .....	10
Ent. 108 .....	5
Poul. Hus. 125, 126, 105 or 106 .....	6
Ag. Engr. 101 or 109 .....	5
Appl. Stat. ....	8
Electives .....	12
	—
	46

Suggested Electives: Irr. and Dr. 10; Vet. Sci. 140; Animal Husbandry 155; Chemistry 115, 121, 122; English 5, 111.

## Poultry Husbandry Courses

**1. Poultry Production.** A study of breeds of chickens and turkeys, incubation, brooding, feeding, selection, marketing, and problems of production of chickens and turkeys. Exercises in practical problems are included in the laboratory section. Four lectures, one lab. (5S)  
**Draper**

**\*104. Embryology and Incubation.** Emphasis on the embryology of the chick with considera-

tion of problems involved in incubation and hatchery operations. Three lectures and one lab. Lab. arr. (4S)  
**Carson**

**\*105. Poultry Management.** Problems of locations of poultry farm, farm planning, renewing the flock and management problems of the growing, laying and breeding flocks. Prerequisite: Poultry 1. (3W)  
**Draper**

**\*\*106. Poultry Breeding.** Application of selection pressure, selection indexes, mating systems and heritability in predicting genetic gains. Prerequisite: Poultry 1, Math. 35, Zool. 112, and Principles of Animal Breeding. (4S)  
**Carson**

**\*\*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. Prerequisite: A. H. 150. (3S)  
**Anderson**

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

**125. Special Problems.** Selected problems to meet student needs. Registration by permission only. Prerequisites: Poultry 1. Credit arranged. (F, W, S)  
**Staff**

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

**Poultry Diseases.** (See Veterinary Science 120.) (4S)

**Principles of Nutrition.** (See Animal Husbandry 150. (4W)  
**Staff**

**210. Research Problems in Poultry Husbandry.** Credit arranged. (F, W, S)  
**Staff**

**Nutrition and Biochemistry.** Seminar (See Animal Husbandry 270.)

\*Taught 1961-62.

\*\*Taught 1962-63.

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### Department of

# Veterinary Science

PROFESSOR *Merthyr L. Miner*, HEAD; ASSOCIATE PROFESSOR *Don W. Thomas*; ASSISTANT PROFESSORS *Joseph T. Blake*, *Jay W. Call*, *Ross A. Smart*, *James A. Thomas*; RESEARCH ASSOCIATE *Arland E. Olson*; RESEARCH ASSISTANT *Martha W. McCartney*; COLLABORATORS *Wayne Binns*, *J. LeGrande Shupe*.

### Office in Veterinary Science Building

Courses in this department are not designed to train you to become a veterinarian. If you desire to study toward a degree in veterinary medicine (D.V.M.), you must have at least two years or preferably three of preveterinary training at some authorized college or university, completing the basic required courses. You should then apply for entrance into a school of veterinary medicine. Enrollment in veterinary schools is limited. If you are majoring in either bacteriology, zoology, animal husbandry, dairy husbandry, poultry husbandry, or chemistry, you are eligible for entrance into all veterinary schools if the requirements in the basic sciences are fulfilled.

The state of Utah has entered into a compact with the Western Interstate Commission for Higher Education whereby Utah will subsidize the training of five students in each of the four years in veterinary schools operating under the compact. If you are a Utah resident and have completed the pre-veterinary requirements, you must apply to the Utah Commission for certification to the three Western veterinary schools co-operating under the compact. You must also make an independent application to the schools of your choice. Your ac-

ceptance is dependent on the choice of students by the veterinary schools.

### Suggested Pre-Veterinary Courses

The following are basic pre-veterinary requirements of most schools of veterinary medicine: English 1, 2, 3; Mathematics 35, 46; Zoology 3, 4, 112; Botany 24; Chemistry 3, 4, 5, 115, 121, 122; Physics 17, 18, 19; Animal Husbandry 1, 2, 10; Poultry 1; Dairy 2; Humanities, 10 hours (literature, world civilization, speech, language, art, music); Social Science, 10 hours (American history or American government, economics, psychology, sociology); Physical Education or Military Science.

In addition, courses in the following subjects are required or recommended by some schools of veterinary medicine: calculus, statistics, biochemistry, embryology, foreign language, marketing, accounting, business, bacteriology.

### Veterinary Science Courses

**20. Anatomy and Physiology of Domestic Animals.** A study of how the animal's body is constructed and functions. Each system is studied separately; emphasis on the digestive and reproduction systems. Four lectures, one lab. (5W)

**Blake**



## Veterinary Science 55

**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. (4S) **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 of artificial insemination, 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. (3S) **Call, Miner**

**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. Any quarter. Credit 1 to 3. **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 food deficiency alterations. Prerequisites: Zool. 118 and 128. Three lectures, two labs. (5W) **Miner**

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

**\*Taught 1961-62.**

**\*\*Taught 1962-63.**





*College of Business  
and Social Sciences*

College of

# Business and Social Sciences

*Department of Business Administration  
and Secretarial Science, 60*

Accounting, 61  
Finance, 61  
Marketing, 61  
Personnel and Industrial Relations, 61  
Production Management, 62  
Business Education, 66  
Secretarial Science, 68  
and Family Life, 69

*Department of Economics, 72*

*Department of History and Political Science, 74*

History, 74  
Political Science, 77  
Pre-Law, 78  
Social Science, 79

*Department of Sociology and Social Work, 79*

Sociology, 79  
Social Work, 81

**Degrees Offered:**

Bachelor of Science  
Master of Business Administration  
Master of Science  
Doctor of Philosophy

*College of*

## Business and Social Sciences

Robert P. Collier, Dean

### Office in Main 312

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 forefather's experience and rise upward to new heights of human existence. Sociology deals with the group relationships within the family, subcultures, work environment, and other groups. Special attention is given to social work, crime, population problems, women's role in society, and the 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 better.

The purpose of the College of Business and Social Sciences is to provide an education that is practical and realistic, fitting 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. In addition, the four Departments in the College offer the following majors:

The Department of Business Administration and Secretarial Science offers the following majors: Accounting, Business Education, Finance, Marketing, Personnel and Industrial Relations, Production Management, Secretarial Science. The Department of Economics offers the major in econom-



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ics. The Department of History and Political Science offers majors in History, Political Science, and Pre-Law, as well as excellent training for the Foreign Service. Our Sociology Department offers majors in Sociology and Social Work. Opportunities for rewarding careers are excellent in all these fields. Successful business executives earn the largest financial rewards that our system has to offer, while the demand for social scientists is ever increasing as our society grows in complexity and size.

Many significant scholarships are available to students majoring in Banking and Finance, Economics, Transportation, Social Relationships, Accounting and other areas in the College. The top ten per cent of the graduating class are awarded

membership in the Honorary Scholastic Fraternity of Phi Kappa Phi.

The 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 C.P.A., Social Worker, Secretary, Lawyer, Salesman or Marketing Expert, Personnel Manager, Historian, High School Teacher, Banker, Economist, Politician or Governmental Worker, Foreign Service, Juvenile Court Worker, Criminologist, Welfare Worker, Production Manager, Financial Wizard, College Professor, Public Administrator.

Graduate work is available in all departments in the College of Business and Social Sciences.

### Department of

## Business Administration and Secretarial Science

(Accounting, Business Education, Finance, Marketing, Personnel Management, Production Management, and Secretarial Science)

PROFESSORS *Robert P. Collier*, HEAD, *William H. Bell*, *Norman S. Cannon*, *V. D. Gardner*, *L. Mark Neuberger*; ASSOCIATE PROFESSOR *Thomas L. Foster*; ASSISTANT PROFESSORS *Howard B. Calder*, *Donald W. Dobler*, *Ray James*, *Helen Lundstrom*, *Lyle McIff*, *Floris S. Olsen*, *William V. Tezak*; INSTRUCTOR *Annette B. Peterson*; LECTURER *Charles P. Olson*.

### Office in Main 312

Three general areas of specialization are open to you in this Department: (1) Business Administration or Management, (2) Business Education, and (3) Secretarial Science. Business Administration is discussed first, with Business Education and Secretarial Science covered on following pages.

The basic objective of the first two year's program in the Department of Business Administration is to provide a broad and sound foundation upon which to build in the last two years of study when the more specialized courses will be taken. The following program is recommended for Business majors to provide such a broad basis

## Business Administration 61

### FRESHMAN

	Credits
Basic Communications.....	9
Biology 1.....	5
Physiology 4 (or other biological science) .....	5
Math. 24, 25, 26 or 34, and 35.....	9 or 8
History or Political Science.....	5
Psychology 53.....	5
Approved Electives.....	8
P.E., M.S., or A.S.....	3 - 6
Total .....	48 to 52

### SOPHOMORE

B.A. 1, 2, 3, Introductory Accounting..12	
B.A. 4, 5, 6, Business Law.....	6
Economics 51, 52.....	10
Language Arts (literature, speech, etc.) .....	10
Sociology, History, or Political Science .....	5
Approved Electives (physical science, math.) .....	5
P.E., M.S., or A.S.....	3 - 6
Total .....	48 to 51

You will note that this program for the first two years includes few business courses and definitely stresses the social sciences and group requirements. Your adviser can counsel you in the specific scheduling of these classes or in alterations of this basic program to fit your particular situation. This basic program will, however, fill all of your group requirements, your physical education requirements, and lay a solid basis for later specialization in any field in the College.

After a broad foundation during your first two year's work, specialized majors are available in the following fields in the general area of Business Administration:

### Accounting

Accounting is part of the ancient and honorable profession of record keeping, but now emphasizes the interpretation and analysis of data. If you wish to major in this area, you should take the following

courses, in addition to the general lower division requirements: *Junior year*: B.A. 101, 102, 103, 111, 131, 132, 133, 134, 151, Econ. 165. *Senior year*: B.A. 121, 122, 127, 143, 149, 181, Econ. 107, 108, as well as additional Business Law. Accounting majors customarily take a minor in Economics.

### Finance

Finance concentrates upon the management of money in the financing of business and investments. If you are interested in this field, you should take the following courses: *Junior year*: B.A. 131, 132, 133, 134, 150, Econ. 165, 171, 172, Eng. 112. *Senior year*: B.A. 149, 151, 181, 182, Econ. 139, 155.

### Marketing

Marketing is concerned with the distribution or "cash-register" phase of business. Without sales and distribution, our entire system would immediately collapse. If you are interested in Marketing and Selling, you should take the following courses during your last two years: *Junior year*: B.A. 131, 132, 133, 134, 151, 152, 153, 171, and Econ. 107. *Senior year*: B.A. 143, 149, 150, 161, 181, and Econ. 171, 172.

### Personnel and Industrial Relations

All successful business operations depend upon manpower, and its successful coordination is essential in all phases of business activity. If you are particularly interested in working with people in the recruiting, training, testing, and human relations aspects of management, you should take the following courses: *Junior year*: B.A. 131, 132, 133, 134, 135, 143, I.E. 104,

## 62 College of Business and Social Sciences

Econ. 125, 126, 127, Psychology 155. *Senior year*: B.A. 149, 150, 151, 171, 172, 173, Econ. 107 and 108 (or Econ. 171 and 174), Sociology 158.

### Production Management

The program in Production Management provides opportunities for the development of supervisory and management skills connected with the production process itself. Practical work experience is very valuable in this field, and your advisor will be glad to assist in this regard. If you choose to major in this general area, you should take the following courses: *Junior year*: B.A. 131, 132, 133, 134, 135, 143, 150, 151, 181, T.M.E. 56. *Senior year*: B.A. 136, 137, 138, 149, 171, Econ. 125, 172, 174, Psychology 155. Technology, science, and mathematics are recommended as electives.

### Graduate Study

The Department of Business Administration and Secretarial Science offers three graduate programs. All of these programs provide small classes with intimate contact with the major professors, significant individual flexibility, and an emphasis upon individual research and development.

Financial assistance is available in the form of Graduate Assistantships for outstanding candidates who lead introductory sections of accounting or statistics or otherwise assist the faculty. USU also offers a limited number of Research Fellowships which are open to all majors, including business and the other social sciences.

*Master of Business Administration*. The MBA degree is open to qualified graduate students regardless of their previous major. The time necessary for completion

will depend, however, on the individual background and preparation. One year should suffice for a well-trained business and economics major, while two years may be required if little or no previous business training has been taken. The emphasis is upon broad training which will integrate the students' knowledge of the business world, and provide a basis for long-range advancement. We attempt to provide development of those attitudes, skills, and character needed in top level management throughout the years ahead. This program can terminate either in a thesis or series of research papers under Plan B. Considerable flexibility is available in terms of specialization in the thesis or independent research, but the heart of this graduate program is a year-long seminar built upon group discussion of individual reports, case studies, as well as discussion of the broad social responsibilities of business leadership.

*Master of Science Degree in Accounting* is available for students wishing to concentrate in accounting or pursuing the Certified Public Accounting Degree. This program can be completed in one year by students with a strong background in accounting and business but would require considerably more time for students lacking the basic background. This sequence terminates in a CPA review course which is aimed at guiding and advising the student to a successful completion of the CPA examination. Dr. Norman S. Cannon is the Director of Graduate Studies in the Business Administration Department, and should be consulted for additional information on the specific course content required.

*Master of Science in Business Education*. The Master of Science

## Business Administration 63

degree is also available to students of business education who are planning a teaching career in the field of business. This sequence can be pursued during the regular academic year, but is also available for students who only attend during the summer. Attendance at three summer sessions should enable a student with the proper background to complete this program. This program features summer workshops, attracting national leaders in accounting, shorthand, typing, etc., to enrich the students' experience and offer a program of quality unmatched even at much larger institutions. This program is under the supervision of Dr. Thomas L. Foster and he will be happy to provide additional details or consultation.

### Business Administration Courses

**1, 2, 3. Introductory Accounting.** Lectures, problems and practice sets that require application of the theory advanced. Principles and techniques learned here are basic to further study of accounting and to understanding the common problems of business. Technique emphasized. (B.A. 1: 4F, W; B.A. 2: 4W, S; B.A. 3, 4F, S) **Staff**

**4, 5, 6. Business Law.** Course 4 is a general survey. It is also introductory for students who take additional Commercial Law courses. Courses 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, 2S) **Olson**

**14. Electric Accounting Machines.** A survey of the development and contribution of better ways and means of keeping records as factors in the cultural growth of societies. The basic principles involved in record keeping and data processing by means of modern electric accounting machines. (3F, S) **Bell**

**15. IBM Machine Practice.** A laboratory course in the operation of electric accounting machines such as the key punch, verifier, sorter, interpreter, reproducing punch, collator, and tabulating machine. One hour of demonstration and two hours of individual practice on the machine each week. Prerequisite: B.A. 14; or B.A. 14 and 15 may be taken concurrently. (1F, 1W, 1S) **Bell**

**20. Introduction to Business.** A survey of the general problems of business organization. (3F, 3W) **Calder, Tezak**

**30. Business Mathematics.** Students who score 80 per cent or above in the mathematics placement examination or who take college algebra, should not register for this course. Does not fill exact science group requirement. (3F, 3W) **Bell**

**63. Salesmanship.** The history, development, and opportunities in sales work. The principles of preparing for interviews, proper presentation, gaining favorable attention, arousing the desire to buy, meeting objections, and creating acceptance. Special projects are conducted in relation to a particular type of selling. Lectures and cases. (4F, 4S) **James**

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

**101, 102, 103. Intermediate Accounting Principles.** Fundamental techniques of accounting. Gives a working knowledge of accounting as it serves the business executive. Valuable to students who aspire to a career in accounting, and also to teachers, lawyers, engineers, and farmers. Graduate credit may be allowed upon compensation of special work. (4F, 4W, 4S) **McIlff**

**104, 105, 106, 107, 108. Business Law.** Course 104 studies the law of negotiable instruments; 105 and 106 include study of the law of bailments, sales and personal property, partnerships, corporations, and bankruptcy. Courses 107 and 108 include the law of real property, including estates, deeds, conveyancing, abstracts of title, mortgages, wills. Courses 105 and 106 alternate with 107 and 108; 107 and 108 will be given in 1961-62. Prerequisites: B.A. 4, 5, 6 or the consent of the instructor. (3F, 3W, 3S) **Olson**

**111. Industrial Cost Accounting.** Job costing, process accounting, and special considerations. (5W) **Gardner**

**116. Accounting Machines Wiring.** Wiring of control panels for the operation of the accounting machine, the reproducing punch, and the collator in the preparation of assigned reports. Prerequisite: B.A. 14. Two lecture periods and two lab periods of two hours each. (3W, S) **Bell**

**117. Introduction to Stored Programming.** Basic Computer logic, flow charting, routines, coding, library programs, and data processing application to business. Prerequisite: B.A. 116 or its equivalent. (3F) **Staff**

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**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. Prerequisite: B.A. 116. Two lectures and one lab. (3S) **Staff**

**121, 122. Auditing Theory and Practice.** A study of the principles and procedures associated with accounting verification and audit practice. Prerequisite: A good working knowledge of accounting principles and techniques. (3F, 3W) **Cannon**

**127, 128. Income Tax Accounting.** A study of the problems arising with the imposition of taxes on income by the Federal Government, with emphasis on the accounting phases of these problems. (4F, 4W) **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. (3S) **Cannon**

**131, 132. Business Statistics.** Application of statistical methods to business problems: graphs, analysis of time series, interpretation of index numbers and statistics of particular industries and business in general. Prerequisites: Econ. 51, 52. (3F, W, S) **Tezak**

**133. Management Concepts.** The investigation and application of fundamental concepts of management and organization theory. The development of a working knowledge of fundamental managerial techniques of economic analysis and control. Preliminary study of selected management problems: plant location, product determination, procurement, and inventory control. Prerequisites: B.A. 1, 2, 3, Econ. 51, 52. (3F, S) **Dobler**

**134. Industrial Management Problems.** Provides an integrated view of the production function and an understanding of its problems as they relate to other business activities. Emphasizes control while studying the following topics: plant layout, methods improvement, performance standards, production control, quality control, maintenance, and cost control. Prerequisite: B.A. 133. (3W) **Dobler**

**135. Industrial Techniques.** A foundation course covering: a study of major production processes; basic machine processes and work routing; study and practice in spatial visualization skills, and interpretation of engineering drawings. Prerequisites: T.M.E. 56 or equivalent. (3S) **Dobler**

**136. Production Management I.** 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 activities. Prerequisites: B.A. 133, 134, 135, or equivalent. (4W) **Dobler**

**137. Production Management II.** The planning and indirect control of production activities and costs. Topics are studied from a managerial point of view and specifically include: industrial maintenance, industrial safety, plant layout, methods analysis, and performance standards. Prerequisites: B.A. 133, 134, 135, or equivalent. (4W) **Dobler**

**138. Production Management III.** The quantitative analysis of selected production problems. Topics covered include: the use of schematic models, applications of statistical quality control, sampling inspection, other techniques of statistical inference, and an introduction to the use of linear programming in production. Prerequisites: Math. 34, B.A. 132, 135, or equivalent. (4S) **Dobler**

**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) **Calder**

**141. Real Estate.** Introduction to real estate contracts, forms, principles, and recent Federal housing legislation. (3S) **Durtschi**

**143. Business Communications.** Fundamental principles of effective business writing and other forms of communication, such as letters, memos, reports, etc. Not open to freshmen. (3F, W, S) **Neuberger, Lundstrom**

**147, 148. Administration of Small Business.** (For non-business majors only.) Designed for students in Engineering and Technology, Agriculture, etc. Attention paid to factors determining the establishment of a business, form of the business; such operating problems as accounting, statistical control, financial control, and problems of marketing. (3W, 3S) **Calder**

**149. Business Policy.** A co-ordinating course to develop perspective, judgment, and facility in solving problems in production, distribution, personnel, finance, control, and social aspects of business. Prerequisites: B.A. 131, 132, 150, 181. Required of all Business Administration majors. (5S) **Gardner**

**150. Managerial Accounting.** Emphasizes the use of accounting as a tool of control for management. Major aspects include budget and managerial control, break-even charts, selection of alternatives. Required of all Business Administration majors. (5F) **Gardner**



## Business Administration 65

**151. Marketing Principles.** Aims to describe, analyze, and evaluate our present marketing system. Provides basic tools and background for understanding marketing principles. (5F, W, S) **Calder**

**152. Marketing Problems and Cases.** Devoted to the analysis and solution of marketing problems by business firms. Case studies. Prerequisite: Marketing 151 or permission of the instructor. (5W) **Calder**

**153. Marketing Readings and Research.** Provides perspective by studying both the changing market environment and outlook as conditioners of our material welfare. Prerequisite: Marketing 151 and 152. (5S) **Calder**

**154. Purchasing.** The significance of purchasing as a major activity in modern business. Consideration given organization, policies, and control of the procurement function. Lectures and problems. (3F) **Staff**

**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. (5F) **Calder**

**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. (5) **James**

**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. (5F, S) **James**

**164. Credit Administration.** Nature and functions of credit: forms of credit instruments, sources of credit information, organization and management of credit operating functions, technical and legal aspects of collections, credit and collection control. (3S) **James**

**171. Personnel Administration.** Critical analysis of problems of labor management that confront the manager of a business enterprise and of policies and methods of dealing effectively with these problems. Lectures, problems, and selected cases. (5F, S) **Neuberger, Marston**

**172. Personnel Practices.** Application of personnel techniques in the industrial setting. The application and study of job evaluation, wage administration, testing and selection, training programs, employee benefit programs, etc. (3W) **Marston**

**173. Case Problems in Personnel Management.** The application of principles of personnel administration to specific personnel problems commonly found in industry. Case studies will be used. (3S) **Marston**

**181. Corporation Finance.** How does the corporation raise its capital? A study of modern financial principles, methods, policies, and institutions. Corporate organization, creation, and reorganization. Prerequisites: Econ. 51, 52; B.A. 1, 2, 3. (5W, S) **Collier**

**182. Problems in Finance.** The application of basic principles of finance to specific cases and problems of a typical nature. Prerequisites: B.A. 181, Econ. 165. (3S) **Collier**

**185. Managing Personal Finances.** Designed to aid in meeting the growing complexity of personal finance: 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. (5W) **James**

**199. Internship in Accounting.** Practical experience with public accounting firms and approved business in the Intermountain and Pacific Coast Region for selected seniors. Credit arranged, not to exceed 7 hours. (W) **Staff**

## Graduate Courses

**201, 202. Advanced Accounting Principles.** The study of special accounting problems. (3F, 3S) **Cannon**

**207. C.P.A. Review.** A course 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. (3S) **Cannon**

**211. Advanced Cost Accounting.** Special cases in estimating costing, standard costing, direct costing, and advanced theory in cost accounting. (5S) **Gardner**

**290. Thesis.** For students preparing a master's degree thesis. Credit arranged. (F, W, S) **Staff**

**291, 292, 293. Graduate Seminar in Business Administration.** Discussion and individual reports on various phases of Business Administration. Required of all master's candidates,

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but may be taken by superior seniors, with the instructor's approval. Nine units of credit may be counted in this sequence. (3F, W, S)

Staff

295. Independent Research and Reading.  
Credit arranged. (F, W, S) Staff

298. Accounting Seminar. (S) Cannon

### Business Education

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 an undergraduate and a graduate program in Business Education are available for students preparing to teach, as well as experienced teachers of business subjects. See Catalog, School of Graduate Studies, for detailed requirements for completing the Master's degree.

The following curriculum is suggested for students preparing to enter the business education profession. It should be recognized that changes in the suggested program may be worked out with your adviser. The program of studies for transfer students must be adjusted to meet the minimum professional requirements and allow for acceptance of transfer credit.

Composite major (B.A.-S.S.) minimum 60 hrs.

Major 30-50 hours

Minor (if desired) minimum 18 hours

Required Courses (R)

Suggested Courses (S)

#### FRESHMAN YEAR

##### Fall

Eng. 1 Basic Com. ....	3	R
Biology 1 .....	5	R
B.A. 30 Bus. Math or Math Course .....	3	R
S.S. 65 Filing .....	2	R
S.S. 41 Elem. Type or equiv. ....	2	R
P.E. or M.S. ....	1	R
	16	

##### Winter

Eng. 2 Basic Com. ....	3	R
Phy. 4 Phys. or Bact. 10 .....	5	R
Math. or Ex. Sci. Elect. ....	5	R
S.S. 42 Inter. type or equiv. ....	2	R
P.E. or M.S. ....	1	R
	16	

##### Spring

Eng. 3 Basic Com. ....	3	R
Math. or Ex. Sci. Elect. ....	3	R
S.S. 43 Adv. Type .....	2	R
Psy. 53 El. Gen. Psy. ....	5	R
P.E. or M.S. ....	1	R
	14	

#### SOPHOMORE YEAR

##### Fall

B.A. 4 Bus. Law or equiv. ....	2	R
B.A. 63 Salesmanship .....	4	S
S.S. 75 Fund. of Shorthand I .....	3	S
B.A. 1 Intro. Accounting .....	4	R
Lang. or Arts elect. ....	3	R
P.E. or M.S. ....	1	R
	17	

##### Winter

B.A. 2 Intro. Accounting.....	4	R
B.A. 5 Bus. Law or equiv. ....	2	R
Lang. or Arts elect. ....	5	R
S.S. 76 Fund. of Shorthand II .....	3	S
S.S. 92 Bus. Mach. ....	2	R
P.E. or M.S. ....	1	R
	17	

##### Spring

B.A. 6 Bus. Law or equiv. ....	2	R
S.S. 77 Fund. of Shorthand III .....	3	S
Lang. or Arts elect. ....	2	S
Econ. 51 Gen. Econ. ....	5	R
B.A. 3 Intro. Accounting.....	4	S
P.E. or M.S. ....	1	R
	17-18	

#### JUNIOR YEAR

##### Fall

Econ. 52 Econ. Prob. ....	5	R
Psy. 100 Human Gr. & Dev. ....	3	R
P.H. 155 Public Health .....	3	R
S.S. 167 Office Pract. ....	3	R
Elective or minor .....	3-4	
	17-18	

##### Winter

B.A. 185 Mng. Per. Fin. or Upper B.A. elect. ....	5	S
Psy. 102 El. Psy. for S.T. ....	3	R
B.A. 143 Bus. Com. ....	3	R
Soc., Hist., or P.S. elect. ....	3-5	R
S.S. 186 Sect. Procedures.....	3	R
	17-19	

## Business Administration 67

### Spring

B.E. 189 Prin. of B.E. ....	3	R
Ed. III Prin. of Sec. Ed. ....	3	R
Ed. 114 Org. & Adm. ....	3	R
B.E. 85, Cons. Educ. ....	3	R
S.S. 187 Sect. Procedures ....	3	R
Elective or minor ....	2	
	17	

### SENIOR YEAR<sup>1</sup>

#### Fall

<sup>2</sup> Ed. 115 Sec. Sch. Curr. ....	3	R
B.A. 140 Insurance or Econ. 127 Soc. Sec. or Upper B.A. elect. ....	3	R
<sup>2</sup> B.E. 179 Meth. in B.E. skills ....	3	R
S.S. 141 Dict. & Trans. ....	5	S
B.A. 133 ....	3	R
	17	

#### Winter

B.A. 171 Pers. Adm. or Upper B.A. elect. ....	5	R
B.A. 127 Inc. Tax Acctg. or S.S. 142 Dict. & Trans. ....	4-5	S
<sup>2</sup> B.E. 178 Meth. in B.E. non-skills ....	3	R
S.S. 175 Office ....	3	R
	15-16	

#### Spring

Ed. 129 Stud. Tchg. ....	5	R
Ed. 127 Sec. Sch. Meth. ....	3	R
Ed. 130 Stud. Tchg. ....	4	R
S.S. 143 Dict. or Trans. III or elec. or minor ....	5-3	S
	15-17	

Students who have taken business skill courses such as typewriting and shorthand in high school will be placed in the appropriate level course by means of proficiency examinations. Courses by-passed in this manner should have elective courses substituted for them.

<sup>1</sup>The three senior quarters should be considered as interchangeable so that student teaching may be taken in any quarter. Perhaps the most desirable time for enrolling in student teaching is the Fall Quarter since students will get the experience of seeing classes start at the first of the school year. Methods courses should be taken in the junior year if student teaching is to be taken in the fall or winter quarters.

<sup>2</sup>Students may count either B.E. 178 or 179 toward the 33-credit professional requirement if needed.

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 by departmental approval.

## Business Education Courses

**B.E. 85. Consumer Education.** The general problems of earning and spending an income. Aids to the wise buying of a home, transportation, insurance, and other major consumer items. No prerequisites. (3F, 3W, 3S)  
**James**

**B.E. 178. Methods of Teaching Business—non-skilled.** A study of the methods of teaching as applied to basic business courses. General Business, Business Law, Business Principles, Business Arithmetic, Economic Geography, etc. Also, a study of methods applicable to recordkeeping and bookkeeping. This course is designed for the inexperienced business teacher education student. (3F)  
**Foster**

**B.E. 179. Methods of Teaching Business—skilled.** A study of the methods of teaching as applied to the skill courses. Typewriting, Shorthand, Office Machines, and Office Practice or the inexperienced business teacher education student. (3W)  
**Olsen**

**B.E. 189. Principles of Business Education.** The study of current problems in Business Education and a survey of the recent literature in the field. (3S)  
**Foster**

**B.E. 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)  
**Foster**

**B.E. 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. (3 Su and as needed)  
**Staff**

**B.E. 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 and at the college level. (3Su and as needed)  
**Tezak**

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**B.E. 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) **Foster**

**B.E. 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) **Foster**

**B.E. 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) **Tezak**

**B.E. 270. Workshop in Business Education.** Special workshops on pressing issues, trends, and principles in Business Education. (1-6Su) **Staff**

**B.E. 280. Seminar in Business Education.** An analysis of research methods applicable to business education. (2Su and as needed) **Foster**

**B.E. 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, S, and Su) **Foster**

## Secretarial Science

The program of Secretarial Science is arranged on both a four-year degree pattern and a two-year certificate pattern. Students who initially start on a two-year program may change to a four-year degree program by making up degree requirements.

The following suggested program for the bachelor of science degree with a major in secretarial science may be adjusted by your adviser so as to more specifically meet your individual needs. Transfer students' programs will be adjusted to provide for transfer of credits.

### FRESHMAN YEAR

#### Fall

Eng. 1 (Basic Com.) .....	3
Biology 1 .....	5
S.S. 75 Shtd. I or elect. ....	3
S.S. 41 Elem. Type or elective .....	2
Elective .....	2
P.E. ....	1
	16

#### Winter

Eng. 2 (Basic Com.) .....	3
Physiol. 4 or Bact. 10 .....	5
S.S. 76 Shtd. II or elect. ....	3
S.S. 42 Inter. Type or elective .....	2
S.S. 92 Bus. Mach. ....	2
P.E. ....	1
	16

#### Spring

Eng. 3 (Basic Com.) .....	3
Math. or Ex. Sci. elect. ....	5
S.S. 77 Shtd. III or elect. ....	3
S.S. 43 Adv. Type ....	2
Elective (B.A. 30) ....	3
P.E. ....	1
	17

### SOPHOMORE YEAR

#### Fall

Econ. 51 .....	5
Language Arts elect. ....	5
S.S. 141 Dict. & Trans. I .....	5
P.E. ....	1
	16

#### Winter

Econ. 52 .....	5
Language Arts elect. ....	5
S.S. 142 Dict. & Trans. II .....	5
P.E. ....	1
	16

#### Spring

Exact Science elect. ....	5
Eng. 5 or L.A. elect. ....	3
S.S. 143 Dict. & Trans. III .....	5
S.S. 65 Filing .....	3
P.E. ....	1
	17

### JUNIOR YEAR

#### Fall

B.A. 1 Accounting .....	4
B.A. 4 Bus. Law .....	2
S.S. 94 Key Dr. Calc. ....	2
B.A. 140 Ins. or elect. ....	3
Electives or Minor .....	5
	16

Winter	
B.A. 2 Accounting .....	4
B.A. 5 Bus. Law .....	2
B.A. 143 Bus. Com. ....	3
B.A. 185 Mg. Per. Fin. or upper	
B.A. elective .....	3
Electives or Minor .....	3
Spring	
Psychology 53 .....	15
B.A. 6 Bus. Law .....	5
B.A. 167 Office Practice .....	2
Electives or Minor .....	2
SENIOR YEAR	
Fall	
B.A. 133 .....	15
B.A. 171 Per. Adm. (or 151) .....	3
Electives .....	5
Winter	
B.A. 14 Elec. Acct. Mach. (or elect.) ....	3
B.A. 15 IBM Mach. Pract. (or elect.) ....	1
S.S. 175 Office Management .....	3
S.S. 186 Sec. Proc. ....	3
Electives or Minor .....	6
Spring	
S.S. 87 IBM Key Punch Spd. Bldg.	
(or elect.) .....	1
Econ. 127 Soc. Sec. ....	3
S.S. 187 Sec. Proc. ....	3
Electives or Minor .....	8
15	

Those students who have taken business skill courses such as type-writing and shorthand in high school will be placed in the appropriate level course by means of proficiency examinations. Courses by-passed in this manner should have elective courses substituted for them.

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 by departmental approval.

## Combination Major

*Combination Major in Secretarial or Clerical Practice and Family Life.* This curriculum is designed

for women who desire sufficient secretarial or clerical training to provide professional opportunities outside the home as well as a basic training for family living.

Either the Secretarial type program or Clerical type program may be combined with the Family Life program. The four-year degree program on the previous page may be adjusted so as to emphasize the clerical type program, if desired. Completion of these requirements, in addition to University and group requirements, leads to a Bachelor of Science degree.

## Family Life Courses

### Household Administration

9 hours to be selected from:

H.A. 65 Housing .....	3
H.A. 100 Household Equipment .....	3
H.A. 149 Home Management .....	3
B.E. 85 Consumer Education .....	3

### Clothing Textiles

12 hours to be selected from:

C.T. 51 Art in Everyday Living .....	3
C.T. 6 or 8 Basic Clothing Construction .....	3
C.T. 24 Textiles .....	3
C.T. 33 Intermediate Clothing Const. ....	3
C.T. 185 Family Clothing .....	3

### Foods and Nutrition

8 hours to be selected from:

F.N. 241 Food Selection and Preparation .....	5
Elective .....	3

### Family Life—Child Development

12 hours to be selected from:

FLCD 67 Early Childhood .....	3
FLCD 68 Preschool Laboratory .....	2
FLCD 108 Guidance of the Young Child .....	3
FLCD 100 Human Growth and Development .....	3
FLCD 110 Family Development .....	3
FLCD 115 Growth of the Infant .....	3
FLCD 180 Marriage Counseling .....	3
FLCD 185 The Family in Middle and Later Years .....	3
FLCD 20 Preparation for Marriage and Family Living .....	3
or	
FLCD 120 Marriage .....	3

<sup>1</sup>Required Classes.



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*Two-year secretarial program.* A two-year secretarial course is offered to prepare you for a secretarial position as quickly as possible. An official certificate is granted for successful completion of the two-year course.

### FIRST YEAR

#### Fall

English 1 .....	3
Biology 1 .....	5
S.S. 51 .....	2
S.S. 41 or elect. ....	2
S.S. or elect .....	3
P.E. ....	1
	—
	16

#### Winter

English 2 .....	3
Psychology 53 or Econ. 51 .....	5
S.S. 76 or elect. ....	3
S.S. 42 or elect. ....	2
S.S. 92 .....	2
P.E. ....	1
	—
	17

#### Spring

English 3 .....	3
Exact Science .....	5
S.S. 77 or elect. ....	3
S.S. 43 .....	2
P.E. ....	1
Electives or minor .....	3
	—
	17

### SECOND YEAR

#### Fall

Language Arts .....	5
S.S. 65 Filing .....	3
S.S. 141 .....	5
P.E. ....	1
Electives or minor .....	3
	—
	17

#### Winter

Groups .....	5
B.A. 1 .....	4
S.S. 142 .....	5
P.E. ....	1
Electives or minor .....	3
	—
	18

#### Spring

Groups .....	4
S.S. 94 or elect. ....	3
B.A. 143 .....	3
S.S. 167 .....	2
P.E. ....	1
Electives or minor .....	4
	—
	17

*Two-year Clerical Program.* A two-year clerical program is offered to help you qualify for a clerical position. The official certificate is granted upon completion of the two-year course.

### FIRST YEAR

#### Fall

English 1 .....	3
Biology 1 .....	5
S.S. 51 .....	2
S.S. 41 or elect. ....	2
P.E. ....	1
Electives .....	3
	—
	16

#### Winter

English 2 .....	3
Psychology 53 or Econ. 51 .....	5
S.S. 42 or elect. ....	2
S.S. 92 .....	2
P.E. ....	1
Electives .....	4
	—
	17

#### Spring

English 3 .....	3
Exact Science .....	5
S.S. 43 .....	2
S.S. 65 .....	3
S.S. 94 .....	3
P.E. ....	1
	—
	17

### SECOND YEAR

#### Fall

Language Arts .....	5
B.A. 143 .....	3
B.A. 14 .....	3
B.A. 15 .....	1
P.E. ....	1
Electives .....	3
	—
	16

#### Winter

Groups .....	5
B.A. 1 .....	4
S.S. 87 or elect. ....	1
Econ. 51 or 52 or elect. ....	5
P.E. ....	1
	—
	16

#### Spring

Groups .....	4
B.A. 2 .....	4
S.S. 167 .....	2
P.E. ....	1
Electives .....	6
	—
	17

## Secretarial Science Courses

**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, W, S) **Staff**

**42. Intermediate Typewriting.** Assumes previous training in typewriting. Practice in typing letters, envelopes, manuscripts, business forms. Prerequisite: S.S. 41 or equiv. (2F, W, S) **Lundstrom**

**43. Advanced Typewriting.** Typing of minutes, legal forms, business forms, rough drafts, stencils for duplication. Prerequisite: S.S. 42 or equiv. (2F, W, S) **Lundstrom**

**45. Speed Building Typewriting.** Remedial typewriting, with emphasis on improvement of accuracy and speed. (1F, W, S) **Foster**

**51. Introduction to Secretarial Training.** Designed to develop secretarial efficiency through study of requirements, duties, and personal qualities of a secretary, with special emphasis on personal appearance, manner, applying for and obtaining a position. Required of all lower-division secretarial science students. (2S) **Peterson**

**65. Filing.** Training in alphabetical, numeric, subject, decimal, geographic, and soundex methods of filing. Indexing, coding, and filing of letters and cards. (3F, W, S) **Lundstrom**

**75. Fundamentals of Shorthand I.** Assumes no previous training in shorthand. Study of fundamentals of simplified Gregg shorthand. (3F, W) **Olsen, Peterson**

**76. Fundamentals of Shorthand II.** Continuation of course 75. Introduction of new-matter dictation. Prerequisite: S.S. 75 or equiv. (3W, S) **Olsen, Peterson**

**77. Fundamentals of Shorthand III.** Continuation of course 76. Intensive practice in new-matter dictation. Prerequisite: S.S. 76 or equiv. (3F, S) **Olsen, Peterson**

**87. IBM Keypunch Speedbuilding.** Three one-hour lab periods per week. Prerequisite: One year of typing. Time arranged. (1F, W, S) **Bell**

**92. Business Machines.** Basic training in use of ten-key adding machines, full-keyboard adding listing machines, and rotary calculators. (2F, W, S) **Peterson**

**94. Posting and Keydriven Machines.** Practice in addition, multiplication, subtraction, and division of key-driven calculators and application of the machines to such business computations as percentages, discounts, decimal equivalents, and constants. Application of the ten-key and full-key bookkeeping machines to business and financial institutions. (3F, W, S) **Olsen**

**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. Prerequisite: S.S. 77 or equiv., and S.S. 43 or equiv. (5F, 5W, 5S) **Olsen, Peterson**

**167. Office Practice.** Training in use of dictating and transcribing machines, spirit duplicator, mimeograph, mimeoscope. Prerequisite: S.S. 43 or equiv. (2F, W, S) **Lundstrom**

**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. Prerequisite: B.A. 20, Econ. 51, 52. (3W) **Neuberger**

**186, 187. Secretarial Procedures.** Office routines are studied, with special emphasis on use of reference books, transportation and travel, use of telephone, telegraph, and cablegram service, financial records, writing for publication, minutes and meetings. (3W, 3S) **Olsen**

## 72 College of Business and Social Sciences

### Department of

## Economics

PROFESSORS *Evan B. Murray*, HEAD, *Leonard J. Arrington*, *Robert P. Collier*, *Vernon L. Israelsen*; ASSISTANT PROFESSORS *Reed R. Durtschi*, *Glen F. Marston*.

Office in Main 315B

The Department of Economics offers the Bachelor of Science and Master of Science degrees. If you plan to complete a major you should register with the head of the department after you achieve junior standing. As a prospective major you should take classes in business statistics and in accounting. Any student who plans to do graduate work in economics should have good training in mathematics and in languages. The following upper division courses in economics are required of all economics majors: 106, 107, 108, 165, 171; additional courses will be added from the specialized and applied areas as determined by your specific interests as a prospective major.

Economics 51 and 52 are prerequisites for all of the upper division theory courses.

### Economics Courses

**51. General Economics.** For any university student regardless of major. Principles and institutions underlying operations of the economic system. (5F, W, S) **Staff**

**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, S) **Staff**

**106. History of Economic Thought.** A critical study of the origin and development of economic theories of leading thinkers in Western civilization from 1750 to now. (3F) **Arrington**

**107, 108. Intermediate Economic Theory.** Critical analysis of present-day price, distribution, and income theory. Required of all students majoring in Business Administration, Agricultural Economics, and Economics. (3W, S) **Durtschi**

**125. Trade-Unionism and Collective Bargaining.** Development, structure, function, government, and philosophy of trade unions in United States; making and administering collective agreements; impact upon the economic and political system. (3F) **Marston, Murray**

**126. Trade-Unionism and the Law.** The legal frame-work 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. (3S) **Murray**

**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**

**139. Economics of Security Markets.** Analysis of organization and operation of stock and bond markets, security speculation, brokerage houses, exchange relations with other institutions, security price behavior, exchange regulation. (3F) **Collier**

**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. (5S) **Israelsen**

**147. Public Utilities.** A study of the characteristics of public utilities, regulatory commissions, rate structures, rate discrimination, finance, and rates of returns. (3S) **Israelsen**

**150. Comparative Economic Systems.** A study of the types of economic systems in capitalist, socialist, and communist countries; of the theories upon which they are based, and the alternative methods of organizing economic activity. (3S) **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) **Israelsen**

**170. Economic History of the United States.** Development of agriculture, industry, labor, transportation and finance from colonial times to now. (5W) **Arrington**

**171. Business Cycles.** The economics of cyclical fluctuations. Critical examination is made of the more significant theories offered in explanation of the cycle. A survey of existing and proposed means of control. (3W) **Durtschi**

**172. Business Forecasting.** This course will emphasize short run forecasting and analysis, but some consideration will be given to long-run forecasting. (3W, S) **Marston**

**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) **Arrington**

**180. Economic Growth and Development.** Study of the economic problems of underdeveloped, emergent, and mature economics, and of the alternative techniques and policies for the promotion of growth and development. (2S) **Arrington**

**200. Research in Economics.** Investigations by graduate students. Credit granted according to work done. (F, W, S) **Staff**

**201. Readings and Conferences.** Credit arranged. (F, W, S) **Staff**

**205. Price Theory.** A critical review of a few major topics in price and distribution theory. Open to graduate students and seniors with adequate preparation. (2F) **Durtschi**

**206. Income Theory.** A comprehensive review of the literature and methods of macro-economics, and a study of the public policies based thereon. (2W) **Arrington**

**207. Problems in Economic Theory.** A review of current literature in selected fields of economics. Open to graduates and seniors with adequate preparation. (2S) **Staff**

**209. Problems 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. (2W) **Arrington**

**211. Literature of Economics.** An intensive study of the bibliographical materials and literature of economics. Permission of instructor required. (2W) **Israelsen**

**212. Seminar in Industrial Relations.** Application of principles and practices of American trade-unionism brought to light through individual and group research project: analysis and evaluation of current issues in labor activities. (2W) **Murray**

## 74 College of Business and Social Sciences

### Department of

# History and Political Science

(History, Political Science, Pre-Law, Social Science)

PROFESSORS *M. R. Merrill*, HEAD, *Joel E. Ricks*, EMERITUS, *J. Duncan Brite*; ASSOCIATE PROFESSORS *Wendell B. Anderson*, *Everett L. Cooley*, *S. George Ellsworth*, *M. Judd Harmon*, *Edwin L. Peterson*; INSTRUCTORS *Stanford Cazier*, *Jay A. Emenhiser*.

Offices in Main 103, 210, 274, 275, 276, 277, 278, 279,  
and in Old Forestry 107, 206C

## History

The Department offers work leading to the Bachelor of Science and the Master of Science degrees.

*Major in History.* For a major in History, you must complete 50 hours in History (or 40 hours in History and 10 hours in a closely related field, the courses to be approved by your adviser). Your minor (of a minimum of 18 hours) should be in a closely related field, and courses taken for the minor may not duplicate those taken for the 10 hours of related subjects used for the major if you follow the 40-10 pattern. You should complete as soon as possible survey courses in the history of World Civilizations, History 4 and 5, and in the history of American Civilization, History 13 and 14. History 190 is recommended for the Junior year and History 201 for the Senior year. If you plan to obtain a teaching certificate, you should register early with the College of Education for your work in that field. If you plan to go on to do graduate work in History, it is highly recommended that you complete two years of French or German as an undergraduate.

History constitutes the major study in the subject matter of the

Social Studies curriculum of the secondary schools. If you plan to teach, it is recommended that you either (1) pursue work leading to the major in History and the secondary certificate, or (2) pursue work leading to the teaching major in History and the secondary certificate. 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 teaching major in History, you must complete a minimum of 36 hours in History, and a minimum of 20 hours in a minor. You should complete as soon as possible the survey courses History 4 and 5, and History 13 and 14. History 190 should be taken before you do your practice teaching. As a teaching major in History you should have a broad foundation in the Social Sciences and therefore should look to a minor in one of the Social Sciences and take as much work as possible in geography and the history of literature, philosophy, music and art. All upper division courses in History and work in the minor and allied fields should be selected in consultation with your adviser.



## History and Political Science 75

*Minor in History.* A minor in History consists of 18 or more hours. It is recommended that you take History 13 and 14, and History 1, 2, and 3, or History 4 and 5. A member of the History faculty will be pleased to advise you about the minor.

*The Institute of Utah Studies.* By virtue of its Library holdings, its faculty, and its 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, established for the purpose of encouraging and assisting all persons interested in any phase of Utah's development, offers assistance from the faculty, research opportunities through Library facilities, and courses in regional 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. Your attention is invited to History 135, 137, 226, and 237, and Economics 141.

### Graduate Study

*Master of Science in History.* The program of studies for the Master of Science degree in History is described in the catalog, School of Graduate Studies. If you are interested in this program, obtain a copy of the Graduate Catalog and consult with a member of the History faculty.

*American Studies.* The Department of English and Journalism and the Department of History and Political Science cooperate in administering the graduate program leading to the Master of Science degree in American Studies. See

the Catalog section on English for a statement of that program.

### History Courses

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, W, S) **Staff**

2. **Man and Civilization II.** Continuation of History 1. From about 1500 to about 1850. Not open to those who have had History 5. (3F, W, S) **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. (3F, W, S) **Staff**

4. **World Civilizations I.** The cultural history of the world from earliest times to the end of the seventeenth century. A more detailed course than History 1. Not open to those who have had History 1. (5F, S) **Ellsworth**

5. **World Civilizations II.** Continuation of History 4. From about 1700 to the present day. Not open to those who have had History 2 or 3. (5W) **Brite**

13. **Early American Civilization.** The rise of American civilization from colonization through the Civil War. (5F, W, S) **Cazier, Cooley**

14. **Modern American Civilization.** Continuation of History 13. From the close of the Civil War to the present. (5F, W, S) **Cazier, Cooley**

21. **Latin America to 1800.** Geography, pre-Columbian peoples, conquest and colonization by European powers, international rivalries, political, social, and economic developments. (3W) **Peterson**

22. **Latin America Since 1800.** The Spanish-American revolutions. The growth and development of the Republics of Latin America and their role in the contemporary world. (3S) **Peterson**

### History of Europe and Asia

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
111. **Medieval Europe.** (500-1500 A.D.) Political, economic, social, and cultural developments during the Middle Ages. (3S) Brite
124. **Renaissance and Reformation.** (1250-1600) (5F) Brite
126. **French Revolution and Napoleon.** (1789-1815) (3F) Brite
127. **Nineteenth Century Europe.** Political and economic developments between 1815 and 1914. (3W) Brite
128. **Twentieth Century World.** Political and economic developments in Europe, America, Asia, and Africa since the end of World War I. (3S) Brite
138. **History of Russia.** From the earliest times 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, Cooley
163. **The British Empire.** Rise and decline of the British Empire in the modern world. (3S) Cooley
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) Cazier
167. **European Cultural History II.** European social and intellectual history in the nineteenth and twentieth centuries with emphasis on the development of social institutions and ideas. (3W) Cazier
176. **History of the Far East.** Emphasis on China, Japan, and Russia since 1900. (3W) Brite
144. **Civil War and Reconstruction.** (3S) Cazier
152. **The American Revolution.** The background, philosophy, nature, campaigns, and consequences of the American revolution. (3) Cooley
156. **Cultural History of the United States I.** A social and intellectual history of the United States to 1865 with emphasis on the development of major thought patterns in relation to their social-economic context. (3F) Cazier
157. **Cultural History of the United States II.** A social and intellectual history of the United States since 1865. (3W) Cazier
159. **Recent United States History.** Domestic and foreign affairs of the United States since World War I, emphasizing the development of modern America and her role in world affairs. (3W) Cooley
171. **Constitutional History of the United States.** (5F) Cooley
190. **Sources and Literature of History.** European, Asian and American studies. For all persons preparing to teach or write history. Recommended to history majors in their junior year. (3W) Ellsworth

## Graduate Courses and Seminars

### History of the United States

135. **History of the Far West.** Deals with the region from the Rockies to the Pacific Coast, with emphasis upon the Intermountain West. (5W) Ricks
137. **History of Utah.** Geography and native peoples, early explorations, political, social, and economic developments to the present. (5S) Ellsworth
143. **The Jacksonian Era.** Political, economic, and cultural developments, 1815-1850. (2) Ellsworth
201. **Historical Method.** Seminar in the basic techniques of historical research. History 190 recommended but not required as a prerequisite. Open to seniors. Recommended to graduate students in other fields making use of the historical method in their research. (3F) Cooley
203. **Historiography.** The history of historical writing. (3) Staff
205. **Philosophy of History.** Interpretations, causation and interrelations in history. (3S) Cazier
222. **Seminar in European History.** (2F) Staff
224. **Seminar in American History.** (2S) Staff
226. **Seminar in Western American History.** (2W) Staff
237. **Teaching Utah History.** Seminar in the sources and literature of Utah history, exercises in the preparation and presentation of materials. (3Su) Ellsworth
239. **Readings and Conferences in Special Areas.** Credit arranged. (F, W, S) Staff
298. **Thesis.** Credit arranged. (F, W, S) Staff

## Political Science

If majoring in Political Science, you should have your course schedule approved by the head of the department for at least six quarters prior to graduation. Exceptions may be made by the department faculty.

*Master of Science in Political Science.* The program of studies for the Master of Science degree in Political Science is described in the Catalog, School of Graduate Studies. If you are interested in the program, obtain a copy of the Graduate Catalog and consult with a member of the Political Science faculty.

## Political Science Courses

**1. Government and the Individual.** The course proposes to introduce the student to the political world of American democracy. Totalitarian governments and the philosophies of fascism 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, S) **Merrill**

**10. American National Government.** The basic course of the department. It is highly desirable that this course be taken before upper division courses in Political Science. (5F, W, S) **Staff**

**15. American State and Local Government.** The emphasis is on Utah state, municipal, and county governments. It follows American government. (3W) **Anderson**

**70. Comparative European Governments.** A comparative study of the various forms and kinds of governments that have developed in the modern world with primary attention directed toward Europe. (3F) **Anderson**

**75. Latin American Governments.** In addition to a study of Latin American governments, attention is given to the relations between these countries and the United States. (3W) **Porter**

**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, S) **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 dilemma of our time. (3W) **Merrill**

**110. Basic Problems in International Relations.** Examines current international developments with emphasis on their relation to the United States. (3S) **Merrill**

**111. International Government.** Examines briefly the attempts to achieve some type of international organization. Major emphasis is on the League of Nations and United Nations, including such organizations as United Nations Educational Scientific and Cultural Organization, World Health Organization, Food and Agricultural Organization, International Labor Organization, the World Bank, and the World Monetary Fund. (3S) **Anderson**

**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. Emphasis is on ideas that have been significant in shaping the form and actions of American government today. Students may register for one, two, or three quarters. (2F, 2W, 2S) **Harmon**

**125. Political Parties and Practical Politics.** Organization and practices of political parties. (3F) **Harmon**

**126. Soviet Government and Politics.** Designed to present the structure and functioning of Soviet government and the Communist party system. Attention is also given to the theoretical background of Communist government and party practices in modern times. (3W) **Harmon**

**127. Constitutional Law.** A foundation course in American Constitutional law. The case method is used extensively. Prerequisite: Political Science 10. (5F) **Anderson**

**128. International Law.** A basic course in the law of nations. You should have had at least one course in international relations or foreign policy. (3S) **Anderson**

**129. Public Administration.** Introduction to study of public administration. For students contemplating public service careers. The role and techniques of management in public enterprise, the organization, legal bases, planning, staffing, personnel, finance, and public relations of modern government. (5W) **Anderson**

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**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. (3S) **Anderson**

**140. American Legislation.** 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 legislature. The laboratory methods of approach are used as far as is feasible. Parliamentary law is emphasized. (3W) **Anderson**

**145, 146, 147. History of Political Thought.** Course 145 covers political thought from its beginnings in the Greek period to Machiavelli. Course 146 carries on the study from Jean Bodin to Bentham. Course 147 emphasizes the modern period and gives consideration to democratic, fascist, and communist theories. (3F, 3W, 3S) **Harmon**

**150. World Political Geography.** (4) **Staff**

**160. Theory and Practice of Government.** This course is 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, S) **Harmon**

**180, 181, 182. Current Political Problems.** You may take any quarter without the preceding quarter or quarters. If a lower division student, you must receive consent of the instructor. (2F, 2W, 2S) **Merrill**

**201. Research in Political Science.** Credit arranged. (F, W, S) **Staff**

**203. Readings and Conferences.** Credit arranged. (F, W, S) **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. (3W) **Staff**

**207, 208, 209. Seminar in Political Science.** A two-credit course each quarter with emphasis on one branch of political science each quarter. Only seniors and graduate students with a major in one of the social sciences may register. (2F, 2W, 2S) **Staff**

**211. Thesis.** For graduate students preparing a master's degree thesis. Credit arranged. (F, W, S) **Staff**

**250. Graduate Social Science Seminar.** For graduate students in the social sciences. Programs and procedures devised by social science graduate students and department staffs. (1W) **Staff**

### Pre-Law

USU 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 lesser training. College graduation is recommended even though it may not be required for admission.

If you plan to enter law school, you 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 the School of Graduate Studies, in Main 182.

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.

### Requirements for Pre-Law Majors

American Institutions: P.S. 10 and P.S. 140 are required. Optional selections from the following: P.S. 15, 125, 129, 180, 181, 182. **Total minimum hours 15**

Comparative Government: Optional selections from the following: P.S. 70, 75, 126. **Total minimum hours 3**

International Relations: Optional selections from the following: P.S. 101, 102, 111.

Total minimum hours 3

Political Thought: Optional selections from the following: P.S. 117, 118, 119, 145, 146, 147.

Total minimum hours 5

Public Law: Optional selections from the following: P.S. 127, 128, 131.

Total minimum hours 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, and Economics. You should be a skilled typist and familiar with accounting procedures.

## Social Science Courses

1. **General Social Science.** A basic general education course giving synthesis of the social science disciplines. (5F, W, S) **Peterson**

5, 6, 7. **General Geography.** Europe, Afro-Asia, 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. You may register for one, two, or three quarters. Fall quarter, 5 and 6; winter quarter, 6 and 7; spring quarter, 5 and 7. (3F, 3W, 3S) **Peterson**

105, 106, 107. **Geopolitics: Europe, Afro-Asia and The Americas.** A survey of world geography, with emphasis on international "problem" regions. The cultural, background, language, race, religion, and technology of specific geographic areas will be examined to provide a better understanding of current tensions. (3F, 3W, 3S) **Peterson**

## Department of

# Sociology and Social Work

PROFESSOR *R. Welling Roskelley*, HEAD; ASSOCIATE PROFESSORS *Therel R. Black*, *William A. DeHart*, *Carmen Fredrickson*, *Evelyn H. Lewis*; ASSISTANT PROFESSOR *John A. Pennock*.

Office in Main 212

## Sociology

As a major in Sociology you must, in addition to meeting the group requirements for graduation, complete a minimum of 47 credits in Sociology. Specific required courses will be suggested by your advisor at the time of registration.

Either Sociology 10 or 70 is a suggested prerequisite for all upper division courses in Sociology.

## Graduate Study

The Department of Sociology and Social Work offers courses leading to the Master of Science and Doctor of Philosophy degrees. Research is promoted through departmental relationship with the Agricultural

Experiment Station, with the Division of University Research, and with state and federal agencies.

*Doctor of Philosophy Degree.* This degree is offered in the Department of Sociology and Social Work through collaboration with closely related departments in the Social Sciences. Candidates for a degree are required to spend one year as a student in full time residence at some other university approved for study by the USU Sociology Department.

Institutional requirements of the PhD degree are explained in the Graduate School section. (Also see Catalog, School of Graduate Studies.)



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### Sociology Courses

**5. American Culture.** Basic beliefs, values, customs, and institutions of America. Problems of cultural lag. New knowledge, based upon a changing culture, that should re-direct institutional life to meet the changing needs of people. (3F) **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, co-operation and other interaction processes. Rural institutions and adjustments to meet rural problems. (5F, W, S) **Roskelley, Black**

**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. (5F, W, S) **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. (3S) **Fredrickson**

**100. Educational Sociology.** The group and human relations factors within the school system, and between the school system, the home, and the community. (3W) **Black**

**110. Utah Social Problems.** Analysis and field study of Utah social problems as they affect community living. (3) **DeHart**

**130. Introduction to Cultural Anthropology.** Attitudes, ideas, behavior, social organization and material results of selected primitive and contemporary cultures. (3F) **Black**

**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) **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. (3S) **Roskelley**

**144. Women Today.** The new and challenging roles of women in adjusting to a modern society. (3S) **Fredrickson**

**145. Alcoholism.** See HPER 145. (3S) **Nelson**

**153. History of Social Thought.** Development of social thought from early periods to August Comte. Important developments in Europe and America after Comte; especially early American thought. (5W) **Roskelley**

**154. Population Problems.** How communities, states, and nations are affected by increasing or decreasing populations. The significance of these trends on today's living and planning for the future. (3W) **Pennock**

**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. (3F) **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. (3S) **DeHart**

**160. The Family in Various Cultures.** Historical and institutional approaches to family functions; analysis of comparative family systems; family theory and ideological considerations. (3F) **Staff**

**161. Modern Social Problems.** Major American social problems. Adjustment and instruments of change as means of minimizing disorganization. (3W) **Fredrickson**

**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. (5W) **Black**

**171. Juvenile Delinquency.** Heredity, environment, cultural and social conditions which are causative factors in delinquency. (3W) **Pennock**

**172. Delinquency Prevention.** Modern philosophies about behavioral characteristics of children. Community and organizational programs of delinquency prevention. (3W) **Pennock**

**173. Treatment of Delinquency.** Police methods; juvenile court origin and function; detention, probation, and institutional care of the delinquent child. (3S) **Pennock**

**174. Criminology.** Extent and nature of crime, and various factors related to criminal behavior. Theories of crime causation. Methods of law enforcement. (3W) **Pennock**

**176. Treatment of the Adult-Criminal.** Modern philosophies and methods in the treatment of the adult criminal; jails, and prisons, probation, parole, and other community services. (3F) **Pennock**

**180. Group Dynamics.** Group processes from the point of view of improving individual participation as members and leaders of groups. Social action as a group process. (3W)

DeHart

**190. Seminar in Sociology.** Selected sociological concepts or problems. (1F, W, S)

Staff

**201. Research in Sociology.** A project for original study is organized and field work is carried on under supervision. Prerequisite: Soc. 287. Credit arranged. (F, W, S)

Staff

**\*\*202. Advanced Sociological Theory.** Critical analysis of current sociological theory about human society. (5)

Black

**203. Independent Readings in Sociology.** Reading and conferences on topics selected by the student and the adviser. Credit arranged. (F, W, S)

Staff

**207. Graduate Seminar.** Short subjects within the field of Sociology and pertinent to but not available in regular courses. (2)

Staff

**210. Advanced Rural Sociology.** Analysis of major developments in rural social thought, research and application of both toward solution of social problems throughout the world. (3)

Roskelley

**241. Rural Organization.** Social organization in areas larger than the local community; district, state, regional, national, and international. (2)

Roskelley

**287. Methods of Social Research.** Historical development of Social Research. Methods and techniques of formulating problems, collecting, analyzing, and interpreting data in social research. (3F)

Roskelley

**288. Practicum in Sociological Research.** Supervised application of sociological research in field studies. Credit arranged. (F, W, S)

Staff

\*\*Taught 1962-63.

## Social Work

The demand for qualified Social Workers 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. 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 the best preparation for employment in those positions for which graduate training is not required, as well as the best preparation for graduate study in Social Work. More than 60 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.

*Course requirements for a major leading to a BS degree in social work includes: 49 credit hours selected from courses in social work, sociology, psychology, economics, and political science. Your major professor will aid you in their selection. S.W. 173 is a suggested prerequisite to other social work courses.*

## Social Work Courses

**50. Social Welfare Agencies.** Agencies and institutions which provide social services such as child welfare, family counseling, school social work, and public assistance. (3W)

Lewis

**162. Mental Health.** The prevention and treatment of mental illness and the maintenance of mental health in modern society. (3W)

Lewis

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**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. (3S) **Roskelley**

**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. (3S) **Lewis**

**173. The Field of Social Work.** Social casework, social group work, and community organization. Objectives, processes, and personnel work. (Majors should take S. W. 173 and 175 concurrently.) (3F) **Lewis**

**174. Introduction to Case Work.** Theories and practices of social casework, with emphasis on problems and techniques of interviewing. (3W) **Lewis**

**175. Introduction to Field Work.** Various agencies dealing with social work and related areas: includes field trips. (Taken concurrently with S. W. 173.) (2F) **Lewis**

**177. Treatment of Children with Problems.** Analysis and treatment of problems of children with special needs. (3S) **Lewis**

**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 Sociology 180. **DeHart**

**182. Children in Institutions.** Principles underlying care and treatment of children in institutions and trends in institutional care. (3S) **Lewis**

**195. Social Work Seminar I.** Social Work publications and other source material applicable to the field. (1W) **Lewis**

**200. Social Case Work I.** Principles and methods. Investigation, diagnosis, and treatment. (3F) **Lewis**

**203. Independent Readings in Social Work.** Readings and conferences on topics selected by the student and advisor. Credit arranged. (F, W, S) **Staff**

**240. Community Organization.** Processes operating in rural and urban communities and development of means for co-ordinating them. (3W) **Staff**

**250. Public Welfare Services I.** The operation of a modern public welfare services program, including: public assistance, social security, public services for children. (3S) **Lewis**

**287. Methods of Social Research.** See Sociology 287. (3F) **Staff**



*College of Education*

College of

**Education**

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**Degrees Offered:**

Bachelor of Science

Master of Education

Master of Science

Doctor of Education

## College of

# Education

John C. Carlisle, Dean

Office in Main 181

The College of Education has as its primary function the preparation of teachers, administrators, supervisors and other professional personnel for the public schools. The College consists of the Departments of Agricultural Education; Education; Fine Arts; Health, Physical Education and Recreation; Psychology; and a program in 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 fully accredited through the Master's Degree by the National Council for Accreditation of Teacher Education. The Doctoral program in Education will be evaluated by the National Council during the academic year 1961-62.

*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, 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 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 attention. Facilities in addition to the regular College of Education classrooms include the Nursery School, operated on the campus by the Department of Family Living and Child Development in the College of Family Life. Here teacher education focuses on the pre-school child. The Edith Bowen Teacher Education Laboratory School is a functioning elementary school on the University Campus. The teachers of the school are members of the University faculty. This school serves as a center for teacher education for those students preparing to teach Kindergarten and grades one through six. Here child



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understanding and behavior are studied and desirable school practices are developed.

*The University Council on Teacher 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 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) election, admission, and counseling procedures for students entering teacher education programs; (4) graduation requirements and the recommendation of students for professional certification, and (5) the continued improvement of graduate programs in professional education.

*Teacher Certification.* The College of Education is designated by the Utah State Department of Public Instruction as its official representative 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.

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 ele-

mentary or secondary certificate, a closely supervised program of student teaching is conducted. In elementary education this student teaching is carried on in the Edith Bowen School, and in nearby public schools. In secondary education, all student teaching is done in selected public schools. Contractual arrangements are made for these services with the schools concerned.

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. Those students majoring in other departments of the University who wish to prepare for teaching, are admitted to teacher education curricula as heretofore described.

*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, and EdD degrees are offered. More detailed information is presented in this catalog by the School of Graduate Studies obtained by contacting the Coordinator of Graduate Programs in Education.

*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 has been organized. If you qualify for teaching or other professional certificate you should register with the Service as a help in compiling the proper credentials to be used in placement. Registration should be completed in the winter quarter or early part of the spring quarter.

## Department of

# Agricultural Education

PROFESSOR *Stanley S. Richardson*, HEAD.

### Office in Agricultural Science 15

As a student preparing to teach vocational agriculture you will register in the Department of Agricultural Education. In the curriculum planned for preparing teachers of vocational agriculture, emphasis is given to practical farm experience, a broad background in the major fields of human knowledge, general training in agriculture, and a program of teacher education for youth and adults in the vocation of farming. This curriculum meets minimum requirements for the general secondary and vocational agriculture certificates as set by the Utah State Board of Education. Counseling service is available to assist you in selecting courses throughout your four years of College work.

### Graduate Study

Opportunity is offered for research and graduate study in Agricultural Education. If you plan to do graduate work you should select a coordinated program of study in the Colleges of Agriculture and Education.

### Prescribed Courses for Majors in Agricultural Education

<b>Biological Science:</b>	<b>Cr. Total</b>
Botany 24 <sup>1</sup> .....	5
Zoology 3 <sup>1</sup> .....	5
Zoology 112 (Genetics) .....	5
Bacteriology 10 or 70, & 71 <sup>1</sup> .....	5 20
<b>Language and Arts:</b>	<b>Cr. Total</b>
Environmental Planning <sup>1</sup> .....	3
Speech, or Music, <sup>1</sup> or	
Art or Literature <sup>1</sup> .....	5 8
<b>English</b>	<b>Cr. Total</b>
Basic Communications 1, 2, 3 .....	9

<b>Social Sciences:</b>	<b>Cr. Total</b>
Sociology 10 or 70 <sup>1</sup> or	
Political Science 10 <sup>1</sup> or	
History 14 <sup>1</sup> .....	5 10
<b>Exact Science:</b>	<b>Cr. Total</b>
Chemistry 10, 11, 12 <sup>1</sup> .....	15
Mathematics 34 <sup>1</sup> .....	3
Physics 6 or 7,	
Geology 3 or Math. 35 .....	4 22
<b>Total</b> .....	69

### Basic and Minimum Requirements in Agriculture, Agricultural Engineering, and Education

<b>Animal Industry:</b>	<b>Cr. Total</b>
An. Hus. 10 .....	5
Elective .....	15 20
<b>Plant Industry:</b>	
Agron. 56 or 58 (Soils) .....	4
Elective .....	16 20
<b>Agricultural Economics:</b>	
Agr. Econ. 71, 72, 73 .....	9
Elective .....	3 12
<b>Agriculture:</b>	
Elective .....	8 8
<b>Agricultural Engineering:</b>	
Irrig. 10 .....	4
Ag. Eng. 1, 101, 102, 103 .....	20 24
<b>Total</b> .....	84

<b>Education:</b>	<b>Cr. Total</b>
Education 112, 114, 124, 125, 126.....	22
Psychology 100, 102 .....	6
Public Health 155 (or 154—3 cr.).....	4
Elective .....	3 35
<b>Total Minimum Requirements</b>	
<b>For BS Degree</b>	
Institutional and General .....	69
Agriculture .....	84
Education .....	35
Military Science or P.E. ....	6
<b>Total</b> .....	194

<sup>1</sup>Courses which meet lower division group requirements.

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### Ag Education Courses

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

**124. Methods of Teaching Farm 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, S) **Richardson**

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

**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. (3S) **Extension Staff**

**205. Reading and Conference.** See Education 205. (1-2F, W, S, Su) **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, S) **Richardson**

**271. Research and Thesis Writing.** See Education 271. Credit arranged (F, W, S, Su) **Staff**

**290. Special Problems for Agriculture Teachers.** For teachers of vocational agriculture who desire to develop a more practical program for future, young and adult farmers. (2Su) **Staff**

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

### Department of

## Education

PROFESSORS *John C. Carlisle*, HEAD, *Walter R. Borg*, *Caseel D. Burke*, *J. Elliot Cameron*, *Ellvert H. Himes*, *Lee Grande Noble*, *Heber C. Sharp*, *David R. Stone*; ASSOCIATE PROFESSORS *LeRoy A. Blaser*, *Eldon M. Drake*, *Basil Hansen*, *Terrance E. Hatch*, *Gene S. Jacobsen*, *Edith S. Shaw*, *Marsden B. Stokes*; ASSISTANT PROFESSORS *A. L. Braswell*, *Pearl S. Budge*, *Arthur Jackson*, *Ivan Pedersen*, *D. Jean Pugmire*, *Thomas Taylor*, *Evelyn Wiggins*; INSTRUCTORS *Leon Beutler*, *Joan C. Bowden*, *Kathryn Salisbury*, *Helen Tanner*, *Eyre Turner*.

### Office in Main 181

The Department of Education is organized into two main areas: Teacher Education and Graduate Programs, in Elementary Education, Secondary Education and Education Administration.

### Teacher Education

*Caseel D. Burke*, Chairman

Teacher Education offers programs of study leading to the

Bachelor of Science degree in Elementary Education and in Secondary Education, and to completion of certification requirements for teaching in the elementary and secondary schools of Utah.

Introduction to Education (Education 50) helps the student explore the teaching profession, and is designed mainly for the person who is not sure he wants to become a

teacher and would like further information and guidance before making his decision. Those wanting the course should take it during the freshman or sophomore year.

You are not permitted to enroll in professional courses in education unless you have been admitted to the Teacher Education program, nor will you be admitted to student teaching in either secondary or elementary education unless your total grade point is 2.0 or above, and your grade point average in the teaching major and minor and professional certification subjects, 2.5 or above. You should be financially prepared to spend a quarter off campus student-teaching.

*The Program in Elementary Education.* To obtain the Bachelor of Science Degree in elementary education and qualify for the Utah Teacher's Certificate for elementary schools you must meet the following minimum requirements:

- (1) *Courses designed to provide a liberal background:* See University lower division requirements.
- (2) *Special certification requirement:* Six quarter hours of fine arts.
- (3) *Teaching Majors and Minors.* Thirty credit hours in one field of concentration or eighteen hours in each of two fields. Courses for the major fields of concentration or the two minors may be selected from the fine arts, language arts, social sciences, physical and life sciences, physical education, child development, or psychology.

(4) *A major of 45 hours in professional education as follows:*

*Required Courses*

GROUP I Understanding the Child (minimum of 9 credits)

Psychology 100 or C.D. 100..... 3  
Public Health 155 (or 154, 3 cr.) 4  
Two additional hours selected from Psychology 181, 182, 183, 123, 145, Speech 167, Child Development 67, 68.

GROUP II Understanding the School (minimum of 7 hours)

Education 103 ..... 4  
Education 114 ..... 3

GROUP III Curriculum and Methods and Student Teaching (minimum of 23 hours)

Education 104 ..... 5  
Education 105 ..... 3  
Education 106 ..... 12  
Psychology 108 ..... 3  
*Elective Courses* (Minimum of six hours)

Education 102 ..... 3  
Education 107 ..... 3  
Education 108 ..... 3  
Education 109 ..... 3  
Education 110 ..... 3  
Education 133 ..... 3  
Education 136 ..... 3  
Education 159 ..... 3  
Education 161 ..... 3  
Education 182 ..... 3  
Psychology 127 ..... 3  
Psychology 161 ..... 3  
English 122 ..... 3  
Music 150 ..... 3  
Art 151 ..... 3  
Phys. Ed. 177 ..... 3  
Phys. Ed. 182 ..... 3

*Suggested Sequence of Courses First and Second Years*

Concentrate on filling lower division requirements, and beginning work in the major or minor fields.

Education 50

*Third Year*

Psychology 100  
Public Health 154 or 155  
Education 103  
Education 114  
Courses to fill your major field

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of concentration or your two minors  
Electives in education and related areas.

### *Fourth Year*

Psychology 108

Education 104

Education 105

Education 106

Courses to complete your major field of concentration or your two minors.

Elective courses in education and related areas.

*Kindergarten Certification.* Having completed the requirements for the elementary school certificate, you may obtain the kindergarten certificate by completing Education 133 and 106a. Application for 106a must be made at least one quarter in advance.

*Dual Certification.* A student desiring to obtain both the elementary and the secondary certificates should consult with an advisor in the Education Department early in his program. Ordinarily, dual certification will require at least one additional quarter of work.

*The Program in Secondary Education.* To obtain the Bachelor of Science degree in secondary education and qualify for the Utah Teacher's Certificate for secondary schools, you must meet the following minimum requirements:

(1) *Courses designed to provide a liberal background:* See University lower division requirements.

(2) *Teaching Major and Minor.* A teaching major of not fewer than 36 credits, of which 15 must be Upper Division, and a teaching minor of not fewer than 20 credits, must be completed. In lieu of a teaching major and minor, a composite teaching major consisting of

not fewer than 60 credits in two or more related subjects may be selected. The teaching major and minor or courses in the composite teaching major must be in specific subjects taught in Utah secondary schools. Courses required or recommended are agreed upon by the various subject departments and the Department of Education.

If you choose a teaching major and minor, you may graduate in either the department offering that major or the Department of Education. If a composite major is chosen, you usually major in the Department of Education. Regardless of the department in which you major, you must apply and be granted permission to enter the teacher education program by the admissions committee of the Department of Education. It is advisable to make this application as early as possible in your college program because you will not be admitted to any course in the professional curriculum without first having been approved by the admissions committee.

(3) *Professional courses in education.* For a Utah Teacher's certificate for secondary schools you must complete 33 required hours, and if majoring in secondary education, an additional 3 hours. The professional courses are to be taken in the various divisions as follows:

### Required Courses

GROUP I. Understanding the Pupil  
(minimum of 9 credits)

Public Health 154 (or 155—4 cr.)	3
Psychology 100	3
Psychology 102	3

GROUP II. Understanding the School  
(minimum of 6 credits)

Education 111	3
Education 114	3

GROUP III. Student Teaching, Methods and Curriculum (minimum 15 credits)	
Education 127 .....	3
Education 129 .....	5
Education 130 .....	4

### Special Methods

You are required to take the special methods course in your teaching major if it is offered. If it isn't offered, Education 115 is required. The special methods course in your minor field is also recommended. Special Methods include: Education 118, 124, 151; Art 152; Physical Education 120; Speech 123; Mathematics 150; Music 151, 152, 153; Business Education 178, 179 ..... 3

*Dual Certification.* A student desiring to obtain both the elementary and the secondary certificates should consult with an advisor in the Education Department early in his program. Ordinarily, dual certification will require at least one additional quarter of work.

### Elective Courses

You may also elect additional courses in each of the three groups listed above. These courses are included on the sheet listing certification requirements for teaching in secondary schools, which may be obtained from the Department of Education.

To qualify for a secondary certificate, in addition to meeting requirements in elementary, you 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, including Psychology 102, Education 127 or 138, and 130.

*Homemaking, Industrial Arts, Agriculture.* If you wish to major in Homemaking Education, Industrial Arts Education, or Agricultural Education you should consult the professional education requirements listed under these departments.

### Graduate Study

The College of Education provides programs leading to the graduate degrees of Doctor of Education, Master of Science, and Master of Education. These graduate programs are designed to attract those who demonstrate by aptitude and experience, superior capacities for special preparation as leaders and specialists in educational service. It is the purpose, also, of such programs to furnish opportunities to increase and broaden competencies and supply greater depth in major fields of concentration.

Prospective graduate students are invited to write or consult the Coordinator of Graduate Programs in Education for guidance in initiating a program of studies, information on details of procedure and records, or referral to faculty members who serve as advisers in specific academic areas. Additional information may also be found in the Catalog, School of Graduate Studies.

### Education Courses

**50. Introduction to Education.** A study of the requirements for becoming a teacher and of the values of teaching as a profession. Experience in the course will assist each student to evaluate his potentialities for teaching and will assist the department in selective admission of candidates for the teacher education program. (2F, W, S) Staff

**102. Teaching the Language Arts.** A study of language development in children and its implication for classroom practice: listening, speaking, writing and reading. (3S, Su) Shaw



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**103. 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, S) **Burke, Jackson**

**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, S) **Burke, Pugmire**

**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, S) **Shaw, Pugmire, Wiggins**

**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 should 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. (12F, W, S) **Shaw, Pugmire, Wiggins, and Supervising Teachers**

**106a. 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. Education 136 must be taken or audited concurrently. (5F, W, S) **Shaw, Pugmire and Supervising Teachers**

**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, S) **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) **Shaw, Wiggins**

**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. (3S) **Braswell**

**110. 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. Should be taken after student teaching. (3F, W, S, Su) **Stone**

**111. 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, S) **Carlisle, Hatch**

**113. Principles of Guidance.** Emphasis given to organization of guidance as a service, including individual and occupational differences, tests, measurements, and counseling. (3F, W, S) **Cameron**

**114. Organization and Administration.** Fundamental principles of operating public schools with emphasis on Utah conditions. (3F, W, S) **Hansen, Noble, Stokes**

**115. Secondary School Curriculum.** A study of the secondary school curriculum, junior and senior high school, as it now exists in typical schools, with special reference to Utah. (3F, W, S, Su) **Himes, Carlisle**

**118. Social Studies in the Secondary School.** A methods course for secondary school teachers with teaching majors or minors in any of the social sciences. (3F, S) **Budge**

**119. Extra-curricular Activities.** Designed to acquaint prospective teachers and administrators with extra-curricular programs in secondary schools, and the place of such activities. (2S) **Drake**

**124. The Teaching of English.** Considers what research says about methods of teaching English and what the content of the language arts program should be. Also a review of some fundamentals. (4W) **Budge**

**127. Secondary School Methods.** Considers the problems arising during student teaching. Discusses planning, teaching procedures, adapting classroom practices to individual differences, testing, and evaluation. To be taken during the same quarter as Education 129 and 130. (3F, W, S)

**Budge, Drake, Braswell**

**129. Student Teaching in the Secondary School.** Must be taken concurrently with Education 127 and 130, thus making a block of twelve credits to be completed in one quarter. You should reserve all morning or all afternoon in your daily schedule for these courses. Application for admission to student teaching is made the preceding quarter, and you may enroll only if your application has been approved. You must have completed Education 111 and Psychology 100 and 102. 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 quarter, the student has had guided experiences in all professional responsibilities of the typical faculty member in the secondary school. (5F, W, S)

**McClellan, Budge, Drake, Braswell**

**130. Student Teaching in the Secondary School.** See 129 above. (4F, W, S)

**McClellan, Budge, Drake, Braswell**

**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, S)

**Himes**

**132. Curriculum for the Mentally Handicapped.** 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. Psychology 123 is a prerequisite or should be taken concurrently. (3W)

**Sharp**

**133. 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)

**Pugmire**

**136. Improving Instruction in the Elementary School.** An analysis of the newer concepts of

methods and of the basic factors which contribute to effective learning. Motivation, problem solving, laboratory techniques, and materials of learning will receive attention. (3W, S)

**Shaw, Pugmire**

**138. Improvement of Teaching in the Secondary School.** Designed to meet the needs of teachers, supervisors, and administrators. Emphasizes recent developments in the improvement of teaching in classrooms and activities, from the junior high school to the junior college. (3Su)

**Budge**

**139. Modern Practices in the Teaching of Reading.** In addition to a concern for an adequate developmental reading program, major emphasis will be placed on helping the child who is having reading difficulties. For both the elementary and secondary teacher. (3Su)

**Staff**

**141. Social Foundations of Education.** The social significance of current educational theories and practices. (3W)

**Hansen**

**142. Remedial Reading.** A course designed for teachers, remedial teachers, supervisors, and others interested in the reading process. It emphasizes the developmental sequence in reading, with study of evaluative devices to determine the place of the student in the sequence, and gives suggestions for remedial work. Education 107 is recommended prerequisite. (3Su)

**Stone**

**151. 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 sciences taught in the secondary school. (3W, Su)

**Braswell**

**152. Utilizing Community Resources in Science Education.** Ways of utilizing community resources, natural, industrial, resource persons in providing science experiences. The organization of science clubs, seminars, honor groups, fairs, science talent searches, contests and similar special activities. (3S, Su)

**Braswell**

**156. Student Teaching in Special Education.** Designed to help the teacher apply methods and techniques found to be successful with slow-learning children. 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 Education 106. Students must have completed or be concurrently taking the course in Psychology 123 and Education 132. (3 or 5F, W, S)

**Sharp**

## 94 College of Education

**159. Arithmetic in the Elementary School.** The place of arithmetic in the elementary school curriculum and methods of teaching it in the several grades. (3F, S) **Staff**

**161. Audio-Visual Materials.** Studies the building of a program in which the newest materials and techniques are utilized. Preparation of audio-visual material. (3F, W, S) **Drake, Beutler**

**182. 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. (3F, S, Su) **Hansen, Noble**

### Other Methods Courses in Secondary Education:

**Teaching of Art.** (See Visual Arts 152)

**Teaching of Journalism.** (See Journalism 191)

**Teaching of Math.** (See Math. 150)

**Teaching of Music.** (See methods courses in Music)

**Teaching of Physical Education.** (See methods courses in Physical Education)

**Teaching of Shorthand.** (See Secretarial Science 180)

**Teaching of Typewriting and Bookkeeping.** (See Secretarial Science 179)

**202. Philosophy of Education.** An analysis of the major philosophies of education and their implications for current educational practices. (3F, S, Su) **Hansen**

**203. 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**

**204. Elementary School Curriculum.** An advanced course in elementary school curriculum for graduate students, including experienced teachers, supervisors, and administrators. (3S, Su) **Burke, Shaw**

**205. Reading and Conference.** Provides for individually directed study in subjects of your special interest and preparation. (1-2F, W, S, Su) **Staff**

**207. Elementary School Administration.** Operation and management of the elementary school. (3F, Su) **Jackson**

**208. School Supervision.** Principles and practices of school supervision, including qualifications and responsibilities of supervisors of instruction. (3W, Su) **Burke, Shaw**

**211. Educational Measures.** Principles of measurements, tests and test construction, statistical analysis, and evaluation procedures in education. Prerequisite: Psychology 112. (3W, Su) **Borg, Hansen**

**213. Organization and Administration of Guidance.** (See Psychology 213.) (3W, Su) **Himes**

**217. The Junior High School.** A study of the junior high school as a distinct segment of the American public school system, its functions, organization and curriculum with emphasis upon the core curriculum and common learnings. (3Su) **Hatch**

**218. Public Relations in Education.** Objectives, guiding principles, techniques and media for an improved school public relations program. (5S, Su) **Staff**

**221. School Administration.** 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, S, Su) **Hansen, Stokes**

**223. 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. (3W, Su) **Hatch**

**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. (3F, S, Su) **Hatch**

**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. (3F, Su) **Carlisle, Himes**

**245. 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) **Burke, Jackson**

**246. Seminar in School Administration.** Has two purposes: (1) to assist students with the completion of graduate research problems in school administration; and (2) to serve as a seminar in school administration in which current problems in the field are analyzed. (3S) **Stokes**

**247, 248, 249. Education Seminar.** Opportunity for investigation and report of individual problems and for group discussion and criticism on these reports. Minimum of one quarter required of all Education majors. (1F, 1W, 1S, 1Su)

**Hansen, Himes**

**267. Introduction to Research.** Deals with identifying a problem for the thesis of seminar report, 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: Psychology 112. (3F, S, Su)

**Borg**

**268. Methods of Educational Research.** Designed for the Ed.D. candidate and for the M.S. candidate who desires advanced training in research. Prerequisite: Education 267. (3S)

**Borg**

**271. Research and Thesis Writing.** Individual work in thesis writing with guidance and criticism. Credit arranged. (F, W, S, Su)

**Staff**

**281. 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)

**Stokes**

**298. Field Experiences in School Administration.** Provides introductory experiences in school administration. You work a minimum of five hours weekly under the direction of an administrator in the public schools, either elementary or secondary. Your University supervisor will direct your program and meet with you in seminars periodically. Credit arranged. (F, W, S)

**Hatch, Burke**

**299. Internship in School Administration.** Provides extensive experience for the advanced student working on the Doctor of Education

Degree in School Administration. You work a minimum of one quarter full time under the direction of an administrator in the public schools. (F, W, S)

**Staff**

**302. Readings in Foundations of Education.** Considers problems of education in terms of their sociological, historical, and philosophical foundations. (3W)

**Hansen**

**315. Curriculum Development.** Advanced problems in curriculum building. Philosophic bases of the curriculum, current practices, and organization for curriculum study. (3S)

**Carlisle**

**322. Administration of School Personnel.** Principles and practices in management of teachers, other school employees, and students. (3S, Su)

**Stokes**

**342. Higher Education.** A study of the development and current status of education beyond the high school in America, with emphasis upon the role of the junior college. (3F)

**Himes**

**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. (3S)

**Stokes**

**375. Field Studies and Thesis.** Individual work on research problems in the EdD program. Credit arranged. (F, W, S, Su)

**Staff**

**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. (3W, Su)

**Stokes**

## 96 College of Education

### Department of

## Fine Arts

(Music, Theatre Arts, Visual Arts)

PROFESSORS *Twain Tippetts*, HEAD, *H. Reuben Reynolds*, *Walter Welti*; ASSOCIATE PROFESSORS *Alma L. Dittmer*, *Jessie Larson*, *Floyd T. Morgan*, *Everett Thorpe*, *Irving Wasserman*; ASSISTANT PROFESSORS *W. Vosco Call*, *Max F. Dalby*, *Nancy Gade*, *Harrison T. Groutage*, *Gaell Lindstrom*, *Ronald Stoffel*, *Alvin Wardle*; INSTRUCTORS *Larry Elsner*, *George Pahtz*.

Office in Main 333

The Department of Fine Arts is comprised of Music, Theatre Arts, and Visual Arts. It has a threefold purpose: (1) It offers rewarding contact with the arts to the University and community at large through experience as viewers, listeners or participants in a variety of exhibits, dramas and concerts. (2) It prepares you to teach the arts in the elementary and secondary schools and participate in other professional endeavors in the arts. (3) It offers graduate studies designed to deepen artistic insight and to qualify you for the Master of Science degree and advanced professional positions.

### Music

The Department of Fine Arts program in Music serves three functions: (1) Provides courses which meet lower division or general education requirements in Language Arts; (2) provides courses that further increase understanding and appreciation of music and develop particular skills; (3) provides specific sequences of courses leading to the Bachelor's and Master's degrees in music and music education.

*Music Education Major.* Required courses for a major in music education are in the following divisions: (1) *Music Theory* — 24

hours; Music 4, 5, 6, 104, 105, 106, 107; (2) *Music History and Literature*—9 hours: Music 101, 102, 103; (3) *Music Education*—15 hours: Music 140, 141, 151, 152, 153; (4) *Applied Music*—As a Music education major you shall demonstrate adequate performance skill vocally or instrumentally and will be required to appear in two public recitals, the first before the end of the Junior year, the second in the Senior year. It is therefore recommended that individual instruction be taken all four years. Group instruction in piano, strings, brass, percussion, woodwind and voice will be recommended from the following: Music 80, 81, 82, 83, 84, 85. (5) *Ensemble Performance*—A minimum of six hours selected from the following: Music 25, 125, 26, 126, 27, 127, 28, 33, 133, 36, 136, 42, 43, 44, 45, 46, 135, 137, 138, 139.

*Music Major.* Required courses for a major in music are the same as the foregoing with the following exceptions: (1) Music 80, 81, 82, 83, 84, 85, 151, 152, and 153 are not required; (2) Music 108 and 110 are required; (3) if majoring in Piano you are required to take 180, 181, 182; if an instrumental major you should take 185, 186; if a Vocal major you should take 134, 183, and 184.

A program of individual study will be outlined by the major professor; you shall give an individual graduation recital, preferably in your senior year.

All music and music education majors are required to attend all recitals and musical concerts sponsored by the Fine Arts Department.

## Graduate Study

A Master of Science degree may be earned in Music with a major in either Music Education or Applied Music.

To major in Music Education you must: (1) Have a teaching knowledge of all instruments and voice; (2) be able to play simple accompaniment on the piano. (3) participate in large and small ensemble performances at USU, on an instrument or vocally; (4) satisfy your graduate committee as to competence in vocal or instrumental specialization. (Additional private instruction may be required by this committee.)

In addition to these general requirements, you must take the graduate record examination, and a music counseling examination, which covers music history, literature, theory, education and one instrumental or vocal specialty. From the results of these examinations your graduate committee will be able to suggest the most profitable course work and private instruction necessary to complete the Master of Science degree in Music Education.

Twenty-five hours of music credit beyond the bachelor's degree will be recommended by the advisor. Of these, the following courses are required: Music 258, 3 hours; Music 259, 3 hours; Music 280, 3 hours. You may elect additional credit from the following: Aesthetics; Music 201, 3 hours; Music 205,

credit arranged, and any upper division courses recommended by the advisor.

You may elect a thesis project, or a lecture-recital. All work is to be completed under supervision of the graduate committee.

*Requirements for majoring in Applied Music* are the same as those for Music Education, with these exceptions: (1) You need not have a teaching knowledge of all instruments and voice in order to specialize vocally or instrumentally; (2) your counseling examination does not include the area of Music Education; (3) the Music Education Seminar is recommended, but not required; (4) you may elect a thesis project, a lecture recital or a music recital.

The following course work is a minimum requirement: Music Literature Seminar, 3 hours; Music Theory Seminar, 3 hours; private instruction, 6 hours; ensemble performance, 3 hours. Six hours of credit will be given for the thesis, lecture recital or music recital. You are encouraged to take other elective courses most helpful to your individual situation.

## Music Courses

### History Appreciation and Literature

**1. Enjoying Music.** Designed to increase understanding and enjoyment of music through studying and hearing selected compositions in all musical forms. (3F, 3W, 3S)  
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 to the Baroque; winter quarter covers to Romanticism; spring quarter to contemporary music. Required of all music majors and minors. Music 1, recommended prerequisite. (3F, 3W, 3S)

Wassermann



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**180, 181, 182. Piano Literature.** A listening course designed to present piano music for the general student as well as the trained musician. Fall quarter: music written for the piano to the time of Beethoven; winter quarter: to early Romanticists; spring quarter: to contemporary composers. During all quarters, representative piano literature will be performed and analyzed. (2F, 2W, 2S)  
**Wassermann**

**\*183. Enjoying Opera.** The beginning and development of opera are studied by listening to recordings of great opera literature. (2S)  
**Welti**

**\*\*184. Sacred Music.** Evolution of cantata and oratorio and consideration of modern hymns and sacred music. (3W)  
**Staff**

**185. Symphonic Literature.** The evolution of symphonic music is studied and analyzed from recorded examples from masters of the Baroque, Classic, Romantic, and Contemporary Periods. (3F)  
**Stoffel**

**186. Chamber Music.** An analysis of chamber music forms and their development, including sonata literature. (3W)  
**Stoffel**

**\*201. Introduction to Musicology.** Designed to lay the foundation for broad philosophy of music through a study of music acoustics, aesthetics, sources of music literature, and principles of music pedagogy. (3W)  
**Staff**

**280. Seminar in Music Literature.** A graduate course designed to give a survey of important musical literature and vital source material for its study. (3S)  
**Staff**

### Theory and Composition

**2. Music Fundamentals.** A study of the rudimentary materials of music: scales, intervals, keys, rhythms, meters, terminology for both visual and aural perception. Designed for non-music majors and elementary school teachers. (3F, 3S)  
**Welti**

**4, 5, 6. Beginning Theory.** Fundamental elements of music. Includes sight singing, ear training, rhythmic reading, melodic and harmonic writing and keyboard harmony. Required of music majors. (4F, 4W, 4S)  
**Wardle**

**104, 105, 106. Advanced Theory.** Continuation of Beginning Theory. Includes advanced sight singing, keyboard modulation and introductory counterpoint. (3F, 3W, 3S)  
**Dittmer**

**107. Scoring and Arranging.** Study of each of the standard instruments in use today, their employment in small ensembles and large groups. Scoring and arranging for band and orchestra. (3W)  
**Dalby**

**108. Counterpoint.** Writing music in 16th century contrapuntal style. (3W)  
**Dalby**

**\*\*111. Composition.** Projects in creative composition for more advanced students. Prerequisites 106 and 107. (3S)  
**Staff**

**259. Seminar in Music Theory.** A study of the practical aspects of musical theory as related to analysis, pedagogy and composition. (3F)  
**Dittmer**

### Ensemble Performance

(Classes in Ensemble Performance can be repeated under the same number.)

**25, 125. Orchestra.** Provides training and practical experience in a wide range of orchestral works, including symphonies and major choral works. Credit arranged. (F, W, S)  
**Stoffel**

**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. (2F, 2W, 2S)  
**Dalby**

**28, 128. Varsity Band.** A training band for students who wish to qualify for membership in the University Concert Band. A band practicum to provide additional experience for music majors in rehearsal techniques, conducting and playing minor instruments. Practical study of literature for use in the public schools. (1F, W, S)  
**Wardle**

**33, 133. Choir.** Singing good choral literature. Regular attendance is a condition of membership. A public performance closes each quarter's work. (1F, 1W, 1S)  
**Dittmer**

**135. Opera Workshop.** For those who have a role in the opera or work on the production staff. (1 to 4W)  
**Welti**

**137. Madrigal Singers.** Study and performance of madrigals, motets, and distinctive choral literature. Membership by audition. Auditions are conducted at first and second rehearsals or by appointment with the director. (1F, 1W, 1S)  
**Dittmer**

**138. Men's Chorus.** A selected group of men singers. Admission by audition. Auditions are conducted at first and second rehearsals or by appointment with the director. (1F, 1W, 1S)  
**Welti**

**139. Women's Chorus.** A selected group of women singers. Admission by audition. Auditions are conducted at first and second rehearsals or by appointment with the director. (1F, 1W, 1S)  
**Welti**

\*Taught 1961-62.

\*\*Taught 1962-63.

42. **Piano Ensemble.** Original works for two pianos and for piano, four-hands, training in sight reading, developing ability in ensemble playing. Audition required. Four students per section. (1F, 1W, 1S) **Wassermann**

43, 143. **String Ensemble.** Offers opportunities for capable string players and pianists to form trios, quartets, and other small units. (1F, 1W, 1S) **Pahtz**

44. **Brass Ensemble.** Brass quartets, sextets, and larger groups. Members are selected from applicants. (1F, 1W, 1S) **Wardle**

45. **Woodwind Ensemble.** A study of the literature for woodwind quintet and other small groups. (1F, 1W, 1S) **Dalby**

46. **Vocal Ensemble.** Offers opportunities for capable singers to sing in trios, quartets, etc. Audition required. (1F, 1W, 1S) **Welti**

## Music Education

140. **Choral Conducting.** Basic routines of organizing and training choruses. Assigned projects in conducting small and large vocal ensembles. (3F) **Welti**

141. **Instrumental Conducting.** Basic routines in dealing with instruments in ensembles, band, and orchestra. (3W) **Dalby**

150. **Music for Elementary Schools.** Application of music to the elementary school classroom. Problems, methods, and materials in singing, rhythms, creative music, reading and listening. (3W, 3S) **Dittmer**

151, 152, 153. **Secondary School Methods and Materials.** Teaching and administration of various phases of the music program. 151, **Choral Methods** (3F); 152, **Orchestral Methods** (3W); 153, **Band Methods**. (3S) **Staff**

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**

205. **Special Problems in Music.** An advanced course designed to meet specific problems of the music educator. (1 to 3S) **Staff**

221a. **Woodwind Clinic.** An intensive study of the woodwind instruments, with recommended methods of teaching. Daily, June 19-30. (1Su) **Staff**

221b. **Brass Clinic.** An intensive study of the brass instruments with recommended methods of teaching. Daily June 19-30. (1Su) **Staff**

221d. **Percussion Clinic.** An intensive study of the percussion instruments with recommended methods of teaching. Daily June 19-30. (1Su) **Staff**

251. **Advanced Choral Methods.** Rehearsal techniques and materials to use with the secondary school choir. The study of phonetics and its relation to good choral sound. Teachers registering for this class are expected to sing in clinic chorus. Daily, July 11-22. (1Su) **Staff**

252. **Advanced Orchestra Methods.** Techniques of training the school orchestra. A consideration of special problems relating to the string instruments. Teachers registering for this class are expected to play in the clinic orchestra. Daily, July 11-22. (1Su) **Staff**

253. **Advanced Band Methods.** Techniques in training the band. Private consultation on problems in rehearsal techniques, public relations, etc. Teachers registering for this class are expected to play in the clinic reading band. Daily, July 11-22. (1Su) **Staff**

258. **Seminar in Music Education.** Teaching and administration of various phases of the music program. Special projects. (3W) **Dalby**

## Applied Music, Individual and Class Instruction

(One 30-minute private lesson per week with required practice receives 1 credit.) You may register for individual instruction with any member of the music staff, upon permission of the instructor.

Class instruction is given for beginners, instrumental and vocal. Designed for music education majors, who must be qualified to teach all instruments and voice.

80. **Group Piano Instruction.** (1F, 1W, 1S) **Staff**

81. **Group Vocal Instruction.** (1F, 1S) **Dittmer, Welti**

82. **Group Woodwind Instruction.** (1F, 1W, 1S) **Dalby**

83. **Group Brass Instruction.** (1F, 1W, 1S) **Wardle**

84. **Group String Instruction.** (1F, 1S) **Stoffel**

85. **Group Percussion Instruction.** (1F) **Dalby**

60, 160. **Individual Piano Instruction.** **Staff**

62, 162. **Individual Organ Instruction.** **Staff**

64, 164. **Individual Vocal Instruction.** **Dittmer, Welti**

70, 170. **Individual Woodwind Instruction.** **Dalby**

72, 172. **Individual Brass Instruction.** **Wardle**

74, 174. **Individual Violin and Viola Instruction.** **Stoffel**

75, 175. **Individual Cello Instruction.** **Pahtz**

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The following additional persons have been approved by the University Music staff to give private instruction for University credit: Jeanne T. Welti, Lucy L. Christiansen, Thelma Lundquist, Laverne Odd and Ray Haslam.

University practice studios are available for rental. Time schedules are to be arranged through the Department of Fine Arts. Rental fees are paid at the Controller's office.

### Theatre Arts

The undergraduate curriculum and theatre activities are designed to help you prepare for a teaching career in Theatre Arts, to specialize in Theatre, or to prepare for advanced study.

Forty-five to fifty credit hours of work in Theatre Arts, Speech, and Dramatic Literature are required for the teaching or non-teaching major in Theatre Arts. A detailed list of requirements may be obtained from the department office.

Special curricula may be arranged for you to take a composite major combining courses in Theatre with work in another department or division as Speech, English, Visual Arts, or Music. Sixty credit hours are required for the composite major. Ordinarily such a major can be completed in four college years. If you desire to complete a composite major in Theatre Arts and another division or department you should arrange your program with the advisers assigned to you by the heads of the departments concerned.

For a minor in Theatre Arts a minimum of eighteen credit hours is required, including three hours in FA-TH 1. Other courses to meet your needs are to be selected with the aid of your adviser. For the teaching minor in Theatre Arts twenty to twenty-four credit hours are required.

*Utah State Theatre.* An important aspect of the Theatre Arts

division is the Utah State Theatre, which produces a number of plays each year. As a major or minor in Theatre Arts you are required to participate in every production by acting, or assisting in the staging, lighting and managing of the various dramatic presentations.

### Graduate Study

Theatre Arts offers advanced course work and seminars leading to the Master of Science degree with a major in Theatre Arts. During your first quarter of residence, and before admission to candidacy for the Master of Science degree, you take two diagnostic or program planning examinations. The first of these is a comprehensive written examination covering the basic areas of Drama and Theatre. The second is an oral skills test in which you demonstrate before a departmental committee your competency in voice and diction, extemporaneous speaking and interpretative reading or acting. The results of these diagnostic inquiries are used to assist you and your faculty adviser in planning a complete program of study and in selecting the thesis subject or project.

As a candidate for the Master of Science degree in Theatre Arts you may, with the approval of your supervisory committee, elect to write a thesis or you may present a creative project in playwriting, directing, acting, designing or technical practice. As part of the creative project and in lieu of a thesis, you submit a manuscript, production book or project record.

### Theatre Arts Courses

#### History and Appreciation Courses

Several Theatre Arts classes can make a valuable contribution to any student's general education. The

following courses can be applied to the fulfillment of your Language and Arts group requirements: (1) Understanding Theatre, (2) Current Drama, (10) Drama Appreciation, (54) Children's Theatre.

**1. Understanding Theatre.** A course designed to develop appreciation for theatrical entertainment through learning the contributions of playwrights, actors, directors, designers, technicians, and of theatre buildings. Readings, recordings, pictures, and actual performances are utilized. (3F, 3S) **Staff**

**2. Current Drama.** Plays and musical comedies currently being presented in world theatrical centers are studied and new innovations in theatrical productions are appraised. (3W) **Call**

**10. Drama Appreciation.** A study of dramatic forms (tragedy, comedy, melodrama) and theatrical styles such as realism, romanticism, symbolism and expressionism. (3W) **Morgan**

**100, 102, 104. Masterpieces of Theatre.** A study of plays as presented in the theatre. Fall quarter: Greek, Roman, Medieval and early Renaissance plays. Winter quarter: plays of the late Renaissance to Ibsen. Spring quarter: modern European and American dramas. (3F, 3W, 3S) **Gade**

**130. History of the Theatre.** Historical survey of the evolutionary processes in the theatre from ancient to modern times. Actors and acting methods, stages and production effects, etc. are studied. (5F) **Call**

**160. Playwriting.** Analysis of dramatic structure as it relates to play directing, dramatic literature and the writing of original plays. **Staff**

## Performance

**20. Voice for Theatre.** Vocal development in preparation for actual dramatic performances. Practice in theatre reading for the improvement of vocal power, projection, diction, flexibility and variety. Individual and group practice in the interpretation of lines and scenes. (3F) **Staff**

**44. Fundamentals of Acting.** Theory and practice of the basic concepts of acting. (3F) **Call**

**46. Intermediate Acting.** A continuation of FA-TH 44, with emphasis on characterization and the development of the actor's physical, mental, and emotional resources. (3W) **Call**

**55, 57, 59. 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, 1W, 1S) **Staff**

**124. Theatre Workshop.** Participation in Utah State Theatre plays. Rehearsal and production staff work arranged. Consult instructor for permission to register. (1-6F, 1-6W, 1-6S) **Staff**

**144. Advanced Acting.** Emphasis on the creative approach to acting, analysis and creation of the role and ensemble playing. (3S) **Call**

**\*146. Directing.** Theory and practice of the principles of stage directing. (3S) **Call**

**148. Private Instruction.** Individual tutoring to develop competence in voice, acting, directing, scenic and costume design. Special fee. Credit arranged. (F, W, S) **Staff**

## Production and Staging

**50. Stagecraft.** Technical organization and planning of the production. Building, rigging, and shifting of scenery and construction of properties. (2W, 2S) **Morgan**

**52. Makeup.** Practice and theory of straight and character makeup for the stage. One two-hour laboratory period per week. Recommended for prospective directors of school, church, and community theatres. (1F) **Morgan**

**54. Children's Theatre.** Theory and practice in the selection, preparation and presentation of children's plays. Recommended for prospective elementary school teachers. (3W) **Call**

**56. Puppetry.** The design, construction, and manipulation of puppets. Recommended particularly for elementary teachers. (3W) **Reynolds**

**105. History of Costume.** (See College of Family Life. (3F).

**\*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**

**152. Stage Costuming.** Fundamentals of pattern drafting, construction of stage costumes and accessories, organization and care of costume wardrobes. (3F) **Gade**

**\*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. Prerequisite: FA-TH 58, or consent of instructor. (3S) **Gade**

\*Taught 1961-62.

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**\*154. Stage Lighting.** Study and application of the principles of stage lighting. Practice in planning the lighting for a play, mounting instruments and in the operation of control boards. (2W) **Gade**

**\*156. Theatre Organization and Management.** Study of the managerial aspects (organization, promotion, financing) of the educational and community theatres. (2S) **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. (2S) **Call**

**190. Problems in Drama.** Selected research problems of merit and of mutual interest to students and instructors are investigated. Credit arranged. (F, W, S) **Staff**

**192. Projects in Theatre.** Advanced work in acting, directing, scene design, costume design, makeup, 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 9 credits may be earned in this course. (F, W, S) **Staff**

**194. Problems of Drama Directors.** Play selections, 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. (3 to 5F, W, S) **Staff**

**\*\*196. Advanced Directing.** Practice in stage direction. The student selects, casts, directs, and presents short plays and scenes. Prerequisite: FA-TH 146. (3F, 3S) **Staff**

**200. Seminar in Drama.** Intensive study of special problems in drama and theatre. Credit arranged. (F, W, S) **Staff**

**202. Research Studies.** Advanced research in drama and theatre. By permission of instructors. Credit arranged. (F, W, S) **Staff**

**204. Thesis.** Credit arranged. (F, W, S) **Staff**

**292. Advanced Projects in Theatre.** In any branch of theatre art. Credit arranged. (F, W, S) **Staff**

\*Taught 1961-62.

\*\*Taught 1962-63.

## Visual Arts

*Group Requirement Classes:* A general education in the visual arts is of lasting value to most university students. Several courses are offered which will satisfy your Language and Arts group requirements. These classes are: Visual Arts 1, 8, 10, 14, 19, 21, 27, 30 and 40.

*Major and Minor Requirements:* You may specialize in any of nine major areas. A core of nine courses are required of all visual art majors: Visual Art 1, 2 and 3 or 4, 5, 6, and 7, 8, 10 and 14. The design series, Visual Arts 5, 6 and 7, is a prerequisite which must be completed with at least a grade of "C" before art majors may enroll in classes with higher numbers. The additional major requirements are listed for each area of specialization. The major professor may prescribe other courses to serve the particular needs of different students.

*Advertising Design and Illustration:* One of the most vital areas of art, advertising, design, and illustration, 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 you for a professional job in this field, you must acquire proficiency in lettering, design, rendering techniques and production methods. You also prepare a portfolio of your work to show prospective employers your ability to produce tasteful and imaginative solutions to advertising and illustration problems. In addition to the basic nine courses Advertising Design and Illustration majors are required to take the following: Visual Arts 9, 21, 22,

23, 25, 26, 104, 105, 111, 112, 121, 122. Additional prescribed classes to be selected on consultation with advisors are: Visual Art 19, 27, 28, 29, 30, 40, 107.

*Art Education:* If you want to teach art in the secondary schools you 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 commendable talent are great assets to the art teacher who wants to be a motivating example to his students and sensitive to different student possibilities. In addition to the nine basic courses Art Education majors are required to take the following classes: Visual Arts 19, 21, 25, 27, 30, 40, 60, 111, 115 or 116, 127, 152, plus additional classes prescribed by your advisor.

Minimum Requirements for an Art Minor for students majoring in *Elementary Education*: Visual Arts 5, 8, 14, 50 and 151.

*Ceramics:* Ceramics is the third largest industry in America today. The study of ceramics includes pottery, tile, terra cotta sculpture, brick making, 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 your student work as well as a variety of clays and glazes.

Programs in this area are tailored to fit your needs as an individual student, both beginning and advanced. In addition to the basic nine courses Ceramic majors are required to take: Visual Arts 19, 30, 31, 60, 119, 130, 131, 160, plus additional classes to be prescribed by your major professor.

*Interior and Fabric Design:* 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 homes 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 nine courses, Interior Design Majors are required to take the following: Visual Arts 21, 40, 115, 116, 166, 135, 140, 141; CT&RA 33. Additional prescribed classes to be selected on consultation with advisors are: Visual Arts 19, 30, 111, 121, 125, 160; LA 3; CT&TA 24, BA 63; Hort. 118; H.A. 65; I.E. 70.

*Jewelry and Metalsmithing:* Various metals provide exciting possibilities for the creative artist. For centuries molten metal has been used to cast sculpture. Now hammered sheets of metal can be formed into exciting sculptural pieces. Welding techniques can be used to create art of three dimensional design. There are unlimited possibilities for artistic design in the creation of modern jewelry. In addition to the basic nine courses, Jewelry and Metalsmithing majors are required to take: Visual Arts 30, 31, 19, 119, 120, plus additional classes according to your individual needs as prescribed by your major professor.

*Painting and Drawing:* When



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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. As a student you are not required to follow any one approach to drawing or painting but your own individuality is encouraged. In addition to the basic nine you are required to take: Visual Arts 9, 104, 105, 109, 111, 112, 127. Additional classes prescribed: Visual Arts 25, 30, 40.

**Photography:** Photography is one of the most modern art forms. Recent exhibits of photographic prints in color and black and white have aroused national and international interest among creative artists. There is a basic difference between commercial photography and art photography for creative expression. A thorough mastery of the basic art elements and principles of design are essential for any creative photographer. USU has a well equipped photo studio. In addition to the basic nine courses Art Photography majors are required to take: Visual Arts 21, 27, 28, 29, 105, 121, 125. Upon the recommendation of the major professor other classes may be prescribed and courses in the photography sequence may be repeated with credit in order to improve the student's competence. Portfolios and exhibitions of student work are required.

**Printmaking:** 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 the artists advantages that other art forms do not. Printmaking is perhaps man's most interest-

ing art in that it encompasses so many of the other art activities. To make a fine print you as a student must draw, design, carve, and print. In addition to the nine basic courses Printmaking majors are required to take: Visual Arts 9, 25, 26, 30, 40, 104, 109, 111, 125, 127, 107. Additional prescribed courses for printmaking majors are: Visual Arts 19, 30, 112, 125.

**Sculpture** is one of the oldest forms of artistic creation. Contemporary sculptors are still utilizing the ancient materials of stone, wood, ceramics, and metal. Combinations of new materials and mobiles are increasing the sculptural opportunities. USU is beginning to develop sculpture and hopes to develop it as equal to any of the other major art areas. In addition to the basic nine requirements Sculpture majors are required to take: Visual Arts 19, 30, 9, 104, 105, 31, 130, 60, 160, plus additional classes according to individual needs as prescribed by your major professor.

### Graduate Study

Visual Arts offer you an opportunity for research and graduate study leading to the Master's degree in any of the following nine fields: (1) Advertising Design and Illustration, (2) Art Education, (3) Ceramics, (4) Interior and Fabric Design, (5) Jewelry and Metal-smithing, (6) Painting and Drawing, (7) Photography, (8) Printmaking, (9) Sculpture.

To become a candidate for the Master's degree you must: (1) Pass the qualifying examination given in the School of Graduate Studies. (2) A portfolio of art work must be presented to the Visual Arts Staff for its consideration. The art faculty will determine whether you will be required to take certain

courses to correct any apparent deficiencies. Credit in such courses cannot be counted toward the Master's degree. (3) As a Master's degree candidate you select, with the aid of the department head and a graduate committee, a study program and a thesis project. (4) A minimum of 30 hours must be taken in residence. (5) Six years is the time limit for completion of the degree. This degree may be acquired through summer study. A maximum of nine credits of graduate work completed at another approved Graduate School may be allowed toward the Master's degree. Your graduate committee shall determine whether all or what portion of nine hours will be accepted. (6) At least 45 hours of credit must be taken in courses numbered 100 or above which are approved for graduate credit. (7) Ten credits should be in the 200 category, exclusive of thesis project, for which you can receive a maximum of nine credits. Your thesis project is selected and approved during the first quarter. (8) You can register for no more than three hours of thesis credit per quarter. (9) A written and illustrated record must be kept of the progress on the thesis project. (10) You must pass an oral examination on this thesis project. (11) Three final copies of the written and illustrated thesis project must be prepared. One is for the University library, one remains in the Fine Arts Department, the other is returned to you. (12) At the time of graduation you design a comprehensive exhibit of all your graduate work. The thesis project should be an important part of this display.

## Visual Arts 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, 3W, 3S) **Staff**

**2, 3, 4. Art History.** A three-quarter sequence for Visual Arts 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, renaissance, neoclassical, the important schools of modern art, and contemporary works. (3F, 3W, 3S) **Reynolds**

**5. Beginning Design.** Introduces the basic art elements and is comprised of projects largely in two dimensions. Required of Visual Arts majors. (3F, 3W, 3S) **Staff**

**6. Intermediate Design.** Composition of spacial volume with points, lines, planes and color, and shapes with color and texture. Also sculptural experience with handles, stabiles, and mobiles. Prerequisite: FA-A 5. (3W) **Staff**

**7. Advanced Design.** Introduction of the potential and limitations of various creative media. Design and work with metal, wood, leather, etc. Prerequisite: FA-A 6. (3S) **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, 3W, 3S) **Larson, Lindstrom**

**9. Anatomy for Artists.** Analysis of bone and muscular structure of the body, with emphasis on surface characteristics. Prerequisite to life drawing. (3W) **Groutage**

**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 you understand contemporary trends in art. (3F, 3W, 3S) **Tippetts**

**14. Introduction to Painting.** Basic approaches to painting which develop freedom of expression. Tempera and related media. Recommended as prerequisite to all other painting courses. (3F, 3W) **Larson**

**19. Jewelry and Metalsmithing.** Making interesting jewelry and the design and

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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: FA-A 5, 6, 7. (3F, W) **Staff**

21. **Postermaking.** Elementary and advanced pen and brush lettering. (3F, 3W, 3S) **Groutage**

22. **Beginning Lettering and Layout.** Introduction to basic letter forms such as Roman, Gothic, and Scripts. Lettering for reproduction and indication of lettering in advertisement layout. (3F, 3W, 3S) **Groutage**

23. **Advanced Lettering.** Brush letters and scripts. Finished letters for magazine and newspaper advertisements, packaging labels and symbols. (3S) **Groutage**

25. **Wood Cut.** The making of prints from designs cut in the plank grain of wood using from one to many colors. (3F) **Groutage**

26. **Serigraphs.** The study of various techniques in silk screen printing including glue, tusche glue, cut paper, and lacquer film for the purpose of making multiple original works of art. (3W) **Groutage**

27. **Art Photography.** Means of producing fine photographs. (3F) **Reynolds**

28. **Art Photography.** Texture, composition, lighting and print quality. (3W) **Reynolds**

29. **Art Photography.** Introduction to color, color film, color harmonies, multiple exposures and other techniques necessary to produce fine color work. (3S) **Reynolds**

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 lecture. Desirable prerequisites: FA-A 1, 5. (3F, 3W, 3S) **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: FA-A 30. (3F, 3W, 3S) **Staff**

40. **Essentials in Interior Design.** Study of historic styles; analysis of art elements; principles of design applied to home planning and furnishing. (3F, 3W) **Larson**

50. **Art for Young Children.** For child development majors, mothers, kindergarten and first grade teachers. (3F) **Larson**

60. **Ceramic Sculpture.** Creative expression in a variety of plastic media. Emphasizes aesthetic employment of form and the technique of terra-cotta sculpture. (3S) **Groutage**

104. **Life Drawing.** Anatomical rendering and analysis of the drawing in relation to creative composition. (3S) **Groutage**

105. **Advanced Drawing and Composition.** Emphasis is given to drawing several objects in strong compositional design. (3S) **Thorpe**

109. **Landscape.** Various approaches and techniques in landscape painting, in oil and related media. Fieldtrips. Prerequisites: FA-A 8, 14. (3F, 3S) **Larson**

111. **Watercolor and Related Media.** Experimental approaches in the use of transparent watercolor, casein, and gouache. Part of the quarter is devoted to work in the studio and part outdoors working directly from nature. Prerequisites: FA-A 8, 14. Must be taken simultaneously with Art 127. (3F, 3S) **Lindstrom**

112. **Portrait Painting.** Problems of portrait painting. Any media may be employed. Prerequisites: FA-A 8, 14. (3S) **Groutage**

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: FA-A 5 (3F) **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: FA-A 5 (3W) **Larson**

\*119. **Metalsmithing.** Continuation of FA-A 19. Introduction of forging of flatware and sand casting. Emphasis on original design of holloware, flatware, or other objects of the student's choice. Prerequisites: FA-A 19. (3S) **Staff**

\*120. **Jewelry Casting.** Continuation of FA-A 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. Prerequisites: FA-A 20. (3F, S) **Staff**

121. **Advertising Design and Illustration.** Theory of designing the cover, page, package, letterhead and poster. Basic techniques in illustration. The course trains the student in producing professional advertising and illustrating art which would enable him to find employment in this field. Desirable prerequisite: FA-A 21. (3W, 3S) **Groutage**

\*Taught 1961-62.

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**122. Advertising Design and Illustration Workshop.** Advanced advertising with emphasis on designing and executive advertising pages, booklets, posters, and renderings in a variety of media for the portfolio. Credit arranged. (S) Groutage

**125. Printmaking.** The study of wood cut, serigraph, etching, and lithography as basic techniques for printing multiple original works of art. (3F, 3W, 3S) Groutage

**127. Painting Workshop.** Work may be done in representational or non-representational areas in oil or related media. (3W, 3S) Thorpe

**130. Ceramic Glazing and Decorating.** Explores the many ways of using various types of glazes in conjunction with decorating techniques. Ceramic studio operation and care. Prerequisites: FA-A 30, 31. (3F, 3W, 3S) Staff

**131. Glaze Calculation.** Calculation of glaze formulas; operation of the kilns. Prerequisites: FA-A 30, 31, 130. (3F, 3W, 3S) Staff

**132. Ceramic Workshop.** Advanced work in areas selected with the aid of the major professor. Credit arranged (F, W, S) Lindstrom, Elsner

**135. Color.** Color as a design element in stage lighting, painting, and everyday living. Physical, psychological and artistic aspects are correlated. (3S) Reynolds

**140. Applied Interior Design.** Practical application of art elements and principles of design to problems of home decoration and furnishings. Prerequisite: FA-A 40. (3W, 3S) Larson

**141. Advanced Problems in Interior Design.** Experimental projects in home planning and furnishing. Prerequisites: FA-A 40, 140. (3S) 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. Prerequisites: FA-A 5 and 6 or 14. (3) Reynolds

**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. (3S) Larson

**155. Music Handicrafts.** A workshop course in the construction and study of easily played and informal musical instruments from those of the rhythm band to instruments of adult appeal and of commercial quality. All instruments are simple in construction, and utilize inexpensive and easily obtainable materials and tools. You have a choice of patterning instruments from more than 65 models, or you can develop your own ideas. No previous musical training is necessary. (3 to 5 Su) Staff

**Art 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, Sculpture Studio, Experimental Media Studio, Metalsmithing Studio, Ceramics Studio. Credit arranged. (F, W, S) Staff

**272. Art Research, Seminar and Thesis Problems.** Credit arranged. (F, W, S) Staff

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### Department of

# Health, Physical Education and Recreation

PROFESSOR *H. B. Hunsaker*, HEAD; ASSOCIATE PROFESSORS *H. Cecil Baker*, *Lois Downs*, *Dale O. Nelson*; ASSISTANT PROFESSORS *Pauline Fuller*, *Clayne R. Jensen*, *Lincoln H. McClellan*, *Arthur H. Mendini*; INSTRUCTORS *George Nelson*, EMERITUS, *Jane McKinnon*, *Janice Pearce*, *H. Dale Rasmussen*.

### Office in Smart Gym 26

## Intercollegiate Athletics Staff

DIRECTOR *H. B. Hunsaker*; HEAD BASKETBALL COACH *LaDell Anderson*; HEAD FOOTBALL COACH *John Ralston*; COACHES *Clayne R. Jensen*, *Tony Knap*, *Ralph Maughan*, *Lincoln H. McClellan*, *Evan J. Sorenson*, *Everett C. Thorpe*, *Calvin K. Woodworth*, *Frank Williams*; ADMINISTRATIVE ASSISTANT *Dale Gardner*; TRAINER *Nolan K. Burnett*.

### Office in Fieldhouse

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.

Women must take Physical Education activity courses any six quarters. Classes are selected by the student. No course can be repeated for credit.

Men must take either Physical Education, Military Science or Air Science. Numerous courses in aquatics, dual, team, individual and outing activities are offered each quarter in P.E.

*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 your recreational interests, regardless of your major. Purpose of these activities is to develop a love of wholesome recreation and sufficient skills so that you will continue to participate with satisfaction and enjoyment in various recreational activities after college. Clubs are organized in a variety of activities so that this purpose can be realized. These clubs include hiking, water sports, winter sports, tap dancing, fencing, archery, horse shoes, tennis, golf,

## Physical Education 109

badminton, boxing, swimming, tumbling and square dancing.

*Professional Preparation in Health, Physical Education and Recreation.* You may specialize in any of the following areas: Physical Education, Elementary Physical Education, Secondary Physical Education, Recreation, Health, Dance, Professional Scouting, or Physical Therapy. A composite major including two of the above areas can be taken to meet the major-minor requirement. Selection of a program of study in these areas should be carefully worked out under the guidance of your adviser. The following courses, in addition to the six credits required for graduation, are suggested for each of the above areas:

As a *Non-certifying Physical Education major* you should complete Physical Education 17A, 18, 20, 21, 22, 30, 31, 75, 83, 84, 85 or 92, 106, 107, 108, 183; six credits in Sports Techniques, and ten credits of approved electives.

If majoring in *Elementary Physical Education* you should complete Physical Education 24, 55, 75, 81, 83, 84, 85 or 92, 106, 120, 177, 182, 183, 184; six credits in Sports Techniques and six credits from approved electives.

### Secondary Physical Education Requirements

#### MEN FRESHMEN

Course	Credit		
	F	W	S
P.E. 20, 21, 22 .....	1	1	1
P.E. 75 .....	2	—	—
P.E. 17A .....	Any Quarter	—	—
Group Req. <sup>1</sup> .....	All Quarters	—	—
Minor .....	Any Quarter	—	—
Eng. 1, 2, 3 .....	3	3	3
Electives .....	All Quarters	—	—

<sup>1</sup>Recommended Group Requirement, Ex. Sc.: Chem. 10 and Physics 3 or 6; Biol. Sc.: Zoology 1 and Physiology 4.

#### SOPHOMORE

Course	Credit		
	F	W	S
P.E. 30, 31, 32 .....	1	1	1
P.E. 74 .....	Any Quarter	—	—
P.E. 83 .....	—	3	—
P.E. 84 .....	—	3	3
P.E. 85 .....	3	—	—
Ed. 50 .....	Any Quarter	—	—
Minor .....	Any Quarter	—	—
Group. Req. ....	All Quarters	—	—
Electives (include Physio. 20— Human Anatomy) .....	—	3	—

#### JUNIOR

Course	Credit		
	F	W	S
P.E. 120, 121, 122 .....	2	2	2
P.E. 106, 107, 108 .....	3	3	3
P.E. 188, 189, 190, or 180 .....	2	2	2
P.E. 132 .....	Any Quarter	—	—
Ed. 111, 114 .....	Any Quarter	—	—
Psy. 100 and 102 .....	Any Quarter	—	—
P.H. 154 or 155 .....	Any Quarter	—	—
Minor .....	Any Quarter	—	—
Elective .....	All Quarters	—	—

#### SENIOR

Course	Credit		
	F	W	S
P.E. 130, 131 .....	2	2	—
P.E. 183, 192, 184 .....	3	3	3
Ed. 127, 129, 130 .....	Any Quarter	—	—
P.E. 132 .....	Any Quarter	—	—
P.E. 191 .....	Any Quarter	—	—
Minor .....	Any Quarter	—	—
Electives .....	All Quarters	—	—

#### WOMEN FRESHMAN

Course	Credit		
	F	W	S
P.E. 75 .....	2	—	—
P.E. 20, 21, 22 .....	1	1	1
P.E. 24, 26 .....	1	—	1
P.E. 98 .....	—	—	1
P.E. 17A <sup>2</sup> , 18 <sup>2</sup> .....	Any Quarter	—	—
Basic Communications .....	3	3	3
Group. Req. ....	All Quarters	—	—
Electives .....	All Quarters	—	—

#### SOPHOMORE

Course	Credit		
	F	W	S
P.E. 81, 83 <sup>2</sup> .....	3	3	—
P.E. 92, 84 <sup>2</sup> .....	—	3	3
P.E. 77, 78, 79 .....	1	1	1
P.E. 94, 95, 96 .....	1	1	1
P.E. 74 <sup>2</sup> .....	Any Quarter	—	—
Ed. 50 .....	Any Quarter	—	—
Group Req. ....	All Quarters	—	—
Electives .....	All Quarters	—	—

<sup>2</sup>Courses taught more than one quarter each year.



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### JUNIOR

Course	Credit		
	F	W	S
P.E. 106, 107, 108 .....	3	3	3
P.E. 120, <sup>1</sup> 121, 122, 165 .....	2	2	2
P.E. 132 <sup>1</sup> .....	Any Quarter		
P.E. 150 .....	4		
Ed. 111 .....	Any Quarter		
Ed. 114 .....	Any Quarter		
Psy. 100 and 102 .....	Any Quarter		
Minor .....	All Quarters		
Elective .....	All Quarters		

### SENIOR

Course	Credit		
	F	W	S
P.E. 160, 161, 162 .....	2	2	2
P.E. 183, 192, 184 .....	3	3	3
Pub. Health 154 (or 155—4 cr.) .....	Any Quarter		
Ed. 127 .....	Any Quarter		
Ed. 129 .....	Any Quarter		
Ed. 130 .....	Any Quarter		
Minor .....	All Quarters		
Electives .....	All Quarters		

As a *Recreation major* you should complete Physical Education 3, 74, 83, 84, 85, 153, 157, 179, 183, 196; six credits in Sports Fundamentals; Political Science 15, Forestry 138 or 139 and a combined total of nine credit hours in Sociology, music, drama and crafts.

As a *Health Education major* you should complete Physical Education 55, 84, 135 and 145. Public Health 15, 50, 150, 156, Psychology 33, Child Development 67 and one or more of the following: Foods 5, Social Work 162, Psychology 154, and Zoology 111.

If a *Dance major* you should complete Physical Education 72, 76, 81, 83, 84, 102, 103, 104, 106, 107, 108, 111, 140, 150, 151, 153, 183, 184, and six credits of approved electives.

If planning to enter a *Physical Therapy school* you should complete Physical Education 17A, 18, 55, 74, 75, 83, 106, 107, 108, 183; four credits in Sports Fundamentals, four credits in Sports Techniques,

and 12 hours of approved electives. As a Physical Therapy student you should work closely with your adviser in selecting courses to fill groups and minor requirements.

### Graduate Study

*Master of Science Degree.* 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, you 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. Required courses are: P.E. 250, 271, 295, 299. Ed. 267, Eng. 211, Psy. 112.

If entering the department for graduate study, you should select supporting fields from two other areas of the University, closely allied to Physical Education and Recreation.

You should elect graduate courses from such areas as Education, Public Health, Sociology, Psychology, Biological Science or others acceptable to your graduate committee.

### HPER

#### Activity Courses for Men

- |  |           |
|--|-----------|
| 2. Freshman Football (1F)                | Staff     |
| 4. Boxing (1F, 1W, 1S)                   | G. Nelson |
| 5. Boxing (Advanced) (1F, 1W, 1S)        | G. Nelson |
| 6. Football (1W) (Non-Varsity)           | Ralston   |
| 7. Wrestling (1F, 1W, 1S)                | G. Nelson |
| 8. Wrestling (Advanced) (1F, 1W, 1S)     | G. Nelson |
| 10. Indoor Track and Field (1W)          | Maughan   |
| 12. Track (1S)                           | Maughan   |
| 15. Softball (1S)                        | Staff     |
| 16. Swimming (1F, 1W, 1S)                | Staff     |
| 17. Swimming (Intermediate) (1F, 1W, 1S) | Staff     |
| 23. Basketball (1F, 1W, 1S)              | Eaker     |

<sup>1</sup>Courses taught more than one quarter each year.

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27. Weight Training (1F, 1W, 1S)	Staff
29. Varsity Football (1F)	Ralston
34. Soccer (1F)	Staff
35. Volley Ball (1W)	Staff
36. Self Defense (1W)	Staff
37. Trampoline (1F, 1S)	Staff
38. Tumbling and Gymnastics (1W)	Staff
64. Cross Country (1F)	Maughan

74. Life Saving. Prerequisites: Red Cross Swimmers Card or permission of instructor. American Red Cross Certification is given to students who pass the examination. (2F, 2W) Rasmussen

76. Social Dance (Advanced) (1F, 1S)	Staff
90. Tennis (Intermediate) (1S)	Staff
136. Golf (Advanced) (1S)	Staff
141. Modern Dance (Advanced) (1W, 1S)	Fuller
155. Diving. Prerequisite: PE MW 18 (1S)	Staff

### Activity Courses for Women

39. Soccer-Speed Ball (1F)	Staff
40. Volleyball (1F, 1W)	Staff
41. Basketball (1W)	Staff
42. Softball (1S)	Staff
43. Field Hockey (1S)	Staff
44. Tumbling and Stunts (1W, 1S)	Staff
52. Swimming (1F, 1W, 1S)	Staff
56. Swimming (Intermediate) (1F, 1W or 1S)	Staff
58. Rifle (1W)	Staff
60. Body Conditioning (1F, 1W, 1S)	Staff
152. Synchronized Swimming (1F)	Staff

164. Archery (Advanced) 2nd Quarter (1W, 1S)	Staff
166. Badminton (Advanced) 2nd Quarter (1F, 1W, 1S)	Downs
167. Tennis (2nd Quarter) (1S)	Staff
168. Square Dancing (1F, 1W, 1S)	Jensen

### Professional Courses

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) Staff

\*\*21. Fundamentals of Sports. Designed to develop the fundamental skills of social and square dancing. (1W) Staff

\*\*22. Fundamentals of Sports. Designed to develop the fundamental skills of badminton and golf. (1S) Staff

\*\*24. Dance Laboratory. Folk dancing for freshman and sophomore women majoring or minoring in Physical Education. (1F) Fuller

\*\*26. Dance Laboratory. Tap dancing for freshman and sophomore women majoring or minoring in Physical Education. (1S) Fuller

\*30. Fundamentals of Sports. Designed to develop the fundamental skills of boxing, weight training and wrestling. (1F) Staff

\*31. Fundamentals of Sports. Designed to develop fundamental skills of tumbling, gymnastics and trampoline. (1W) Staff

\*32. Fundamentals of Sports. Designed to develop the fundamental skills of volleyball and speedball. (1S) Staff

55. Safety and First Aid Instruction. Standard and Advanced and Instructor 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) Jensen

### Activity Courses for Men and Women

1. Hiking (1F, 1S)	Staff
3. Skiing (1W)	Staff
9. Fencing (1F, 1W, 1S)	Downs
13. Bowling (1F, 1W, 1S)	Staff
18. Swimming (Advanced) (1F, 1W, 1S)	Staff
19. Skiing (1W) 2nd Quarter	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 of the head of the department before registering. (1F, 1W, 1S)	

D. Nelson

48. Modern Dance (1F, 1W)	Fuller
49. Modern Dance (Intermediate) (1W, 1S)	Fuller
61. Archery (1F, 1W, 1S)	Staff
66. Badminton (1F, 1W, 1S)	Staff
67. Tennis (1F, 1S)	Staff
68. Folk Dance (1F, 1W)	Fuller
70. Tap Dancing (1F, 1W, 1S)	Fuller
71. Tap Dancing (Interm.) (1F, 1W)	Fuller
72. Social Dancing (1F, 1W, 1S)	Staff
73. Golf (1F, 1S)	Staff

\*Taught 1961-62.

\*\*Taught 1962-63.

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**75. Introduction to Physical Education.** An introduction to the history, philosophy, theory and practice of Physical Education. (2F) **Staff**

**\*77. Dance Laboratory.** Techniques of Elementary modern dance for freshman and sophomore women majoring or minoring in Physical Education. (1F) **Fuller**

**\*78. Dance Laboratory.** Techniques of intermediate modern dance for freshman and sophomore women majoring or minoring in Physical Education. (1W) **Fuller**

**\*79. Dance Laboratory.** Techniques of advanced modern dance for freshman and sophomore women majoring or minoring in Physical Education. (1S) **Fuller**

**81. Rhythms and Dramatic Games.** Rhythms for young children; its use in creative movement. Methods of presenting and developing rhythms are studied. (2F) **Fuller**

**83. Playground and Community Recreation Leadership.** Lectures and practical work. Lectures on selection of suitable material and methods of handling various groups. (3F, 3S) **Jensen**

**84. Problems in Physical Growth.** The individual is traced through the various stages of development, with emphasis on the physical aspects of growth. Principles and functions of activity are applied. (3W, 3S) **D. Nelson**

**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) **Staff**

**\*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) **Downs**

**\*96. Physical Education Laboratory.** A professional course for lower division women designed to develop the fundamental skills of softball and field hockey. (1S) **Downs**

**\*\*98. Physical Education Laboratory.** Fundamentals of individual sports for lower division women majoring or minoring in Physical Education. (1S) **Downs**

**102. Dance Composition.** Composition based upon the elements of direction, level, and dimension. Experience in individual and group composing. (2F) **Fuller**

**103. Dance Composition.** Composition based upon the following musical forms: AB, rondo, theme, and variation, canon and round, dance suite. (2S) **Fuller**

**104. Dance Production.** Composition done independently. Participation in a performance required. Lighting, staging, costume and make-up applied to a dance concert. (2W) **Fuller**

**106. Scientific Foundations of Physical Education.** Basically a study of 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. (3F) **D. Nelson**

**107. Scientific Foundations of Physical Education.** Basically 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 principles are then applied to Physical Education. (3W) **D. Nelson**

**108. Scientific Foundations of Physical Education.** Basically a study of the adapted Physical Education program. Includes the administration of a Corrective 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. (3S) **D. Nelson**

\*Taught 1961-62.

\*\*Taught 1962-63.

**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, W, S) **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. (3S) **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. (2F) **Downs, D. Nelson**

**\*\*121. Techniques in Physical Education.** Designed to develop teaching techniques in Social and Square Dance. Open to men and women. (2W) **Staff**

**\*\*122. Techniques in Physical Education.** Designed to develop teachings techniques in tennis and badminton. Open to men and women. (2S) **Staff**

**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. (2S) **Staff**

**\*130. Techniques in Physical Education.** Designed to develop teaching techniques in volleyball, speedball and wrestling. (2F) Seniors only (2S) Juniors only **Staff**

**\*131. Techniques in Physical Education.** Designed to develop teaching techniques in gymnastics, tumbling, and trampoline. (2S) **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, life-saving and use of small water crafts. American Red Cross certification is given students who pass the exam. (2W, 2S) **Rasmussen**

**135. Safety Education.** (a) The needs for safety education; (b) the role of the school in a program for safety; (c) methods and materials for teaching, discussions, and readings, stressing various aspects of safety in many areas. (3S) **Staff**

**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**

**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. (3S) **D. Nelson**

**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. (2S) **Fuller**

**151. Techniques of Dance.** Techniques of a variety of dance types, with emphasis on ballet and modern. (2S) **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. (2S) **Staff**

**157. Social Recreation Leadership.** Practical experience in conducting social recreational activities, such as for church, school and civil groups. Prerequisite: P.E. 83. Credit arranged. (F, W, or S) **Staff**

**\*160. Techniques in Physical Education for Women.** Designed to develop teaching techniques in soccer, speedball and volleyball. (2F) **Staff**

**\*161. Techniques in Physical Education for Women.** Designed to develop teaching techniques in basketball. Consideration is also given to officiating basketball and pep club activities. (2W) **Staff**

**\*162. Techniques in Physical Education for Women.** Designed to develop teaching techniques in softball and field hockey. (2S) **Staff**

**\*\*165. Techniques in Physical Education for Women.** Designed to develop teaching techniques in stunts and tumbling. (2S) **Staff**

**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 out-door, winter sports. Students must provide adequate clothing for field trips. (3W) **Jensen**

\*Taught 1961-62.

\*\*Taught 1962-63.

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**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, 3S) **Downs**

**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. (2S) **Mendini**

**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. (3W, 3S) **Downs**

**183. Interpretation of Physical Education Objectives.** Results and values of Physical Education activities in terms of development, adjustment and standards. (3F) **Hunsaker**

**184. Administration of Physical Education.** Administration procedures in Physical Education in the high school; curriculum and program planning. (3S) **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. (2W) **Staff**

**189. Methods in Basketball.** Coaching and training of basketball teams; emphasis on

the psychology of the game; methods of defense and offense. (2F) **Staff**

**190. Methods in Track and Baseball.** Fundamentals in track and field training, and, the conduct of athletic meets. Fundamentals of baseball, team play, training and strategy. (3S) **Maughan and Williams**

**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. (3S) **Staff**

**192. Tests and Measurements in Physical Education.** Practical studies of tests and technique of test construction. (3W) **Hunsaker**

**194. Problems of Athletics.** Discussion problems in athletics relative to public relations, athletic management, administration of athletics, purchase of equipment, schedules, plant layout, etc. (3S) **Gardner**

**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. (3S) **Jensen**

**250. Reading and Conference.** Credit arranged. Provides for individually directed study. **D. Nelson**

**271. Research and Thesis Writing.** Credit arranged. **Hunsaker**

**295. Problems in Physical Education.** (3F, 3W, 3S) **Hunsaker**

**299. Physical Education Seminar.** (F, W, S) Credit arranged. **D. Nelson**

# Library Science

ASSOCIATE PROFESSOR *Milton C. Abrams*, UNIVERSITY LIBRARIAN; ASSISTANT PROFESSORS *Pearl Carter*, *Ida-Marie Logan*, *Anthony W. Shipps*; INSTRUCTORS *Vilate Ransom*, *Anna Marie Smith*.

## Office on Library Mezzanine

Library Science may be used as a teaching minor in connection with a major in Education. This minor qualifies you for a Library Certificate, issued by the State Department of Public Instruction, and prepares you for a position as school librarian on the elementary or secondary level. A teaching minor of not fewer than 18 credits can be selected from the Library Science courses.

Courses required for Elementary Library Certificates are English 122, L.S. 120, and L.S. 150; for Secondary Library Certificate, L.S. 120, L.S. 150, and L.S. 155.

From the following five elective courses three hours may be used to satisfy the requirements of the Northwest Association of Secondary and Higher Schools: Education 107, 161; English 122, 123; Speech 118.

## Library Science Courses

**50. Reference 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) **Staff**

**100. Advanced Reference and Bibliography.** A survey of the bibliographic organization and retrieval of information in the scientific and technical literature in each of the major disciplines. Prerequisite: Library Science 50. (3W) **Staff**

**120. Technical Library Processes.** Fundamentals of cataloging and the basic techniques necessary for organizing a library collection. Includes Dewey Decimal Classification and steps necessary to place books in circulation. (4W) **Staff**

**150. Library Administration.** Techniques of administration including: How to meet standards of library accreditation, work with teachers, reading guidance, story hours, library displays, methods of teaching the use of the library and planning library quarters. (3W) **Staff**

**151. Library Practice.** Observation and supervised practice in libraries under the direction of library personnel. Designed as the practice teaching experience for librarians. Prerequisite: Library Science 50, 120 and 150. (3S) **Staff**

**155. Book Selection.** Includes a study of book selection aids for both school and public libraries. Book discounts and ordering procedures considered. Reading interests of children and adults stressed. (3W) **Staff**

**160. History of Books and Libraries.** The history of bookmaking, printing, and libraries. (3S) **Staff**

**170. Readings and Conference.** Limited to Library Science minors. Prerequisite: Instructor's consent. Credit arranged. **Staff**



## 116 College of Education

### Department of

# Psychology

(Psychology and Guidance)

PROFESSORS *Arden N. Frandsen*, HEAD, *Ellvert H. Himes*, *Heber C. Sharp*, *David R. Stone*; ASSISTANT PROFESSORS *Jay Caldwell*, *Ronald Peterson*, *E. Wayne Wright*.

Office in Main 175

Psychology—as a bridge between the biological and social sciences—is a scientific approach to understanding man and other animals. Its research interests are the understanding, prediction and control of behavior. Because it has important applications to the improvement of human efficiency, health, and the development and utilization of human resources, the study of psychology contributes both to your professional training and personal development.

A major, and preferably a Master's degree, in psychology should prepare you professionally (1) for guidance and psychological counseling in high schools as a certified counselor or school psychologist; (2) for teaching psychology, study habits, mental health, and personality development in high schools; (3) for diagnostic and remedial teaching, and for dealing with personality and conduct problems of children in elementary schools and in child guidance clinics; (4) (with additional courses in Education) as a teacher of exceptional children; (5) as a clinical psychologist (with additional graduate training) in mental hygiene clinics and hospitals; (6) for personnel work (at the junior professional level) in industry, U. S. Employment offices, various Civil Service positions, and in the military services; (7) (with

additional graduate training) for college teaching and for research in government, industry, or universities, and (8) for further graduate study in psychology, education, child development or social work. Psychology is also a suitable major if you are planning to study medicine, nursing, law, social work, or personnel work after graduating with a Bachelor's degree.

The Department of Psychology has arrangements with schools, social welfare agencies, juvenile courts, and the state industrial school, by which graduate students and some seniors can have practical experience in counseling psychology. The counseling experiences include: educational and vocational counseling; diagnosis and guidance of gifted, subnormal, and delinquent children; diagnosis and treatment of conduct and personality problems; diagnosis and remedial instruction for achievement difficulties in school subjects; teaching psychology in high school or college; teaching exceptional children; and for various kinds of psychometric work.

*Lower Division Preparation for Psychology.* The best preparation for psychology is basic training in biological science, social science, literature, mathematics and physical science. In completing the group requirements, it is recom-

mended that the following courses be included: Physiology 4; Sociology 70; English 35, 40, 41, 58, and other literature (novel and biography) courses; Physics 3 or 7; Mathematics 34, 35, and additional mathematics courses if you have an interest in this subject. The minimum of 40 hours in the "group requirements" might well be exceeded. Psychology courses for lower division students expecting to major in psychology are Psychology 53, 71, and, if desired before attaining upper division status, 100 and 112.

*Requirements for a major in Psychology* include 40 credits of approved courses from the following: Psychology 53, 71, 100 or 202 or 205, 112, 127 or 200, 140 or 145, 161, 181 or 282; and approved courses from Psychology 80, 102, 108, 114, 115, 123, 155, 171, 175, 183, 202, 205. As upper division electives: Sociology 130, 153 or 170; Education 110; Speech 167 or 173; Zoology 102; Physiology 104 or 121, 122 and 123; the Education courses for teacher certification; S.W. 165; and upper division courses in literature. As an undergraduate student you are urged to take courses for a strong minor rather than to over-emphasize psychology courses.

A *minor in Psychology* (which should include Psychology 53, 71, 100 or 202 or 205, 112, 140 or 145, 161, 183, and 181) is recommended for high school teachers who expect to participate in the school guidance program, social workers, majors in speech correction, business administration, or other social sciences.

## Graduate Study

*Master of Science Degree in Psychology.* A program of study for this degree is planned in con-

sultation with your major professor and an advisory committee. A well balanced program to meet your professional objectives may be arranged to include courses from Psychology and other pertinent fields. Psychology and guidance courses prepare you for professional certification as a school counselor or school psychologist, and for continued graduate study in other professional fields of psychology. Besides the courses required for a specific professional objective, the Master of Science degree in psychology should include, during graduate or undergraduate study, courses in the following areas of psychology: (1) general experimental and comparative psychology, (2) systems and history, (3) learning and perception and thought, (4) child and adolescence (included in educational), (5) counseling psychology, (6) mental hygiene, physiological and abnormal psychology, (7) social psychology, (8) personality, (9) statistics, and (10) research thesis. Besides additional courses from those listed in each of the above 10 areas, courses planned especially for graduate students are: Psychology 123, 175, 181, 200, 202, 205, 212, 213, 214, 215, 216, 217, 221, 224, 225, 235, 238, 262, 270, 276, 280, 282, 283, 285, 286, 287, 288, and 289. If you have not majored in Psychology, 30 hours of approved courses in Psychology or closely related fields are a prerequisite to begin study as a graduate student in Psychology.

*Master of Science Degree in Guidance.* With a teaching certificate and a total of 30 credits in Education or/and in Psychology, you are eligible to begin study for this degree. Included in the required courses are: Education 110;

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Guidance 287, 213; and Psychology 123 or 140, 183, 200, 202 or 205, 212, 280, 181, 282, 283, 285, 288, and 289; and a thesis in the field of guidance. These are also the courses required for a Professional Counselor's Certificate.

*Master of Science Degree in Psychology - Speech Pathology.* The Department of Speech in cooperation with the Department of Psychology offers a composite Master of Science Degree in Psychology-Speech Pathology. The course of study includes courses jointly approved by the two departments.

*Doctorate in Educational Psychology and Counseling.* The Department of Psychology, in cooperation with the Department of Education, has planned a program of advanced graduate study in counseling, school clinical psychology, and educational psychology that leads to the Ed.D. degree in Educational Psychology. The program requires two years of graduate study, including supervision of individual study, beyond the M.S. degree, and an internship in school, mental hygiene clinic, or social agency. If interested, confer with Dean John C. Carlisle or Professor Arden Frandsen.

### Psychology Courses

**33. Mental Hygiene for College Students.** Deals with the common personal and social problems of normal people. (3F, W, S) **Sharp**

**53. Elementary General Psychology.** Principles of human behavior and experience, including: nature of personality; factors determining development; how we learn, observe, and think; motives of human conduct; dealing with people; maintenance of personal efficiency and mental health. For any lower division student. (5F, W, S) **Staff**

**71. Experimental Methods in Psychology.** A study of the scientific methods and of specific experimental procedures applied in the study of fundamental problems in psychology. Prerequisite: Psychology 53. (3W) **Sharp**

**80. Reading and Study Skills.** A practical course, highly individualized, designed to aid you in improving the efficiency of your work and study habits. Individual appointments arranged for one-third of the time. (2F, W, S) **Stone**

**100. Human Growth and Development.** A study of the developmental characteristics and processes of human physical and psychological development from birth to maturity. For prospective elementary and secondary teachers. Prerequisite: Psy. 53. (3F, W, S) **Staff**

**102. Educational Psychology for Secondary Teachers.** A professional course for prospective high school teachers. Designed to develop insight of conditions necessary to effective learning. Considers individual differences in students, and means of improving junior and senior high school teaching. Prerequisite: Psychology 53. (3F, W, S) **Stone**

**108. Educational Psychology for Elementary School Teachers.** A study from the point of psychological theory and research of how children learn and of the conditions of effective learning in the elementary school. Prerequisite: Psychology 53. (3F, W, S) **Frandsen**

**112. Application of Statistics to Education and Psychology.** Elementary study of statistical procedures in handling test scores in schools, and of the concepts needed to read current educational and psychological literature. (3F, S) **Frandsen**

**116. Research in Psychology.** The course gives any able and interested senior student in psychology the opportunity to conduct an exploratory, experimental study of a psychological problem in some field in which he is especially interested. Pre-requisite: approval of the sponsoring instructor. (2F, W, S) **Staff**

**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. (3W, Su) **Sharp**

**127. Psychology of Learning.** A comprehensive study of descriptions of learning, of factors related to efficiency, theories of learning. Prerequisite: Psychology 53. (3S) **Frandsen**

**135. Theory and Practice of Play Therapy.** Exploration of theories and potentialities of the specialized play therapy experience. Concepts and principles in the interpersonal process are examined and developed. (3F) **Staff**

**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: Psychology 53. (3S) **Sharp**

**145. Mental Hygiene.** For teachers and other workers in social occupations. Designed to promote understanding of emotional and social adjustment, and as a basis for guiding children, adolescents and adults toward improved mental health. Prerequisite: Psychology 53. (3W) **Sharp**

**155. Psychology of Business and Industry.** Methods and explanatory principles of psychology are applied to understanding several general problems of business and industry, including vocational choice, selection of employees, advertising and selling, marketing and consumer research, conditions for efficient work, and psychological aspects of training for work in business and industry. Prerequisite: Psychology 53 or Instructor's approval. (3F) **Himes**

**161. Social Psychology.** A study of the acquisition of personality of "self." The effect of society on the individual, and the individual's reciprocal effect on society are considered in terms of such topics as propaganda, institutional behavior, "social" neuroses, morale, leadership, and membership. Prerequisite: Psychology 53 (3W) **Staff**

**171. Experimental Psychology.** A laboratory course emphasizing experimental methods and techniques and requiring experiments and reports on selected topics in psychology. Prerequisite: Psychology 112. (3W) **Sharp**

**175. Physiological Psychology.** Physiological mechanisms underlying normal and abnormal behavior, with special attention to those operating in both organic and non-organic disturbances. Prerequisites: Psychology 53 and 71. (3S) **Sharp**

**181. Psychometrics Applied to Guidance.** A study of the selection, evaluation, administration, interpretation, and practical uses of tests of intelligence, aptitudes, interests, personality, and quality of personal and social adjustment. Prerequisite: Psychology 53 and Elementary Statistics. (5F) **Frandsen**

**183. 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. Applications made also to administrative, supervisory teaching, and other interpersonal relation situations. (3W) **Staff**

**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. (3S) **Staff**

**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 in both elementary and secondary schools. (3W) **Staff**

**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: Psychology 102. (This course and Psychology 200 provide training in advanced educational psychology for graduate students in education and in psychology.) (3 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: Psychology 53. (3F, W, S) **Frandsen**

**212. Treatment of Psychometric Results.** Deals with statistical tools as they are applied to psychological testing and to research in education and psychology. The applications and interpretation of statistical results are emphasized. Prerequisite: Psychology 112. (3W) **Borg**

**214. Independent Readings in Psychology.** For students who cannot participate in the discussions in Psychology 215, this course provides opportunity for independent readings and conferences on topics individually selected. (2F, W, S) **Staff**

**215. Seminar, Readings, and Discussions 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, 2S) **Staff**

**217. Research for Master's Thesis in Psychology.** Credit arranged. (F, W, S) **Staff**

**221. Individual Differences.** The nature, extent, and causes of human differences, and the implications and applications of a recognition of these differences in several major life activities. (3S) **Sharp**

**224. Characteristics of the Mentally Retarded.** A study of the characteristics, identification, and treatment of the mentally retarded. Em-

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phasis upon the psychological, social, and educational problems in the treatment and control of the mentally handicapped. (3S)

Staff

225. **Characteristics and Education of the Gifted Child.** A study of the characteristics, means of identifying, guidance, and education of the gifted child. (3W)

Staff

235. **Observation and Case Analysis in Play Therapy.** Observation and examination of case materials. Research in theory and therapy is examined. Attitudes and techniques of the therapist are explored within the context of personal experiences. (3W)

Staff

238. **Practicum in Play Therapy.** Direct experience with children in the play therapy situation. (2S)

Staff

262. **Social Psychology of Teaching.** An application of the concepts of "self" and of "group dynamics" to teaching, and to leadership and participation in other social situations. (3W)

Staff

270. **Perception and Thought.** A study of the theories and experimentation on perception and thought. (3)

Staff

276. **Comparative Psychology.** A phylogenetic study of animal behavior, including perception, motivation, learning, distinctive behavior characteristics, and the factors affecting development. (3)

Staff

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. (3F)

Staff

282. **Individual Diagnostic Intelligence Testing.** Techniques of individual testing, including intensive practice in the administration and interpretation of (a) the Stanford-Binet and Weschsler's intelligence scale for children, in the examination of school-age children, and/or (b) the Weschsler's adult intelligence scale for use with adolescents and adults. (3W)

Frandsen

283. **Theories of Counseling.** A study of the theories of counseling, to develop greater understanding of and a more effective approach to counseling. (3S)

Staff

285. **Introduction to Projective Methods for the Study of Personality.** The dynamics of human adjustment and the common projective methods (other than the Rorschach) for revealing motives, attitudes, and adjustment mechanisms of children and adults. (3S)

Frandsen

286. **Problems in Counseling.** Individual case studies of children and adolescents presenting problems of diagnosis, guidance, remedial teaching, and psychotherapy. (3F)

Staff

287. **Occupational Information.** Collection, classification, and uses of occupational information in counseling. (2W)

Staff

288. **Practicum in Counseling.** Supervised practice in counseling in elementary or secondary schools, in the University, or in clinical or guidance agencies. (2F, W, S)

Staff

289. **Practicum in Psychological Testing.** Supervised practice in psychological testing in elementary or secondary schools, in the University, or in clinical or guidance agencies. (2F, W, S)

Staff

297. **Workshop in Guidance.** A faculty or part of a faculty in a school or 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, S)

Staff

300. **Educational-Psychological Theories in Practice.** From observance and wide reading of educational-psychological theories—on motivation, learning, individual differences, personality, interpersonal relations, evaluation, etc.—hypotheses are formulated for checking by observation in selected school situations, both at the elementary and secondary levels. (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. (3W)

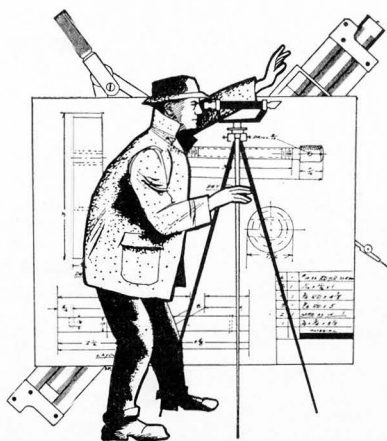
Staff

314. **Advanced Independent Study in Psychology.** (F, W, S)

Staff

317. **Research for the Doctorate Thesis in Psychology.** (F, W, S)

Staff



*College of Engineering*



College of

## Engineering

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Bachelor of Science

Master of Science

Civil Engineer

Irrigation Engineer

Doctor of Philosophy

# College of Engineering

D. F. Peterson, Dean

## Office in Engineering and Physical Science C113

The College of Engineering is comprised of the Departments of Civil and Irrigation Engineering, Electrical Engineering, Mechanical Engineering, Tool Engineering, Industrial and Technical Education, and the Engineering Experiment Station.

*Undergraduate and graduate degrees.* The Engineering departments offer the Bachelor of Science degree in Agricultural, Civil, Electrical, Mechanical, and Tool Engineering. If you are interested in Chemical Engineering, the first two years of work may be taken under the supervision of the Mechanical Engineering Department. The Master of Science and Doctor of Philosophy degrees are offered in the various undergraduate majors, in irrigation engineering and water resources engineering.

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 you plan to do graduate study in Engineering you may also take additional mathematics and physics.

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 quali-

ties essential to high professional achievement. The recommendations of the Engineers' Council for Professional Development have been carefully studied in planning the Engineering curricula and, where applicable, the curricula are accredited by that agency.

*The Department of Industrial and Technical Education* offers undergraduate and graduate degrees in Industrial Arts and Trade and Industrial Education. Undergraduate degrees are also offered in Industrial Technology, with majors in Aeronautical, Automotive, and Welding Technology. Certificates are awarded for completion of two-year technical courses in Aeronautical, Automotive, Drafting, Machine Tool, and Welding Technology. The Department of Industrial and Technical Education has the primary missions of educating teachers in the industrial fields and of providing high-level technical education necessary for direct employment by industry.

*Nuclear Engineering.* A senior sequence of up to eight hours of nuclear engineering may be elected by any engineering major. See course offerings under Department of Mechanical Engineering.

*Admission.* For general requirements see introductory section of this catalog.

*For Engineering,* the following are recommended: English, 3 units; Algebra, 2 units; Geometry, 1 unit; Trigonometry,  $\frac{1}{2}$  unit; Physics, 1

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unit; Chemistry, 1 unit. Minimum admission without deficiencies: English, 3 units; Algebra,  $1\frac{1}{2}$  units; Plane Geometry, 1 unit; Physics or Chemistry, 1 unit. Beginning *Fall 1962* minimum admission without deficiencies: English, 3 units; Algebra, 2 units; Plane Geometry, 1 unit; Trigonometry,  $\frac{1}{2}$  unit; Physics or Chemistry, 1 unit. If you are deficient in Algebra, more than four years will be required unless your deficiency is removed by attendance at Summer School. You should take either Math 34 during the summer preceding your Freshman year or Math 97 during the summer between your Freshman and Sophomore years. You are expected to complete Math 97 prior to beginning Sophomore year courses. If you are deficient in your high school work your admission may be conditional until the deficiencies are removed. Students having deficiencies who do not wish to make them up during Summer Session or who wish to take courses beyond those shown in the prescribed engineering curriculum should arrange a five-year program. If you have major high school deficiencies you should plan to spend your first year in a pre-engineering course emphasizing basic science and mathematics.

*For Industrial and Technical Education* admission requirements are the same as for general admission to the University.

*Scholarship.* You must maintain an average of "C" or higher to remain in good standing in the College of Engineering and to be eligible for graduation. The faculty reserves the right to accept toward graduation only credits with a grade of "C" or higher. If you receive a grade of "D" in any math-

ematics or professional sequence course you must repeat this course before proceeding in the sequence. It is strongly recommended that physics courses with "D" grades be repeated.

*Graduation.* As a candidate for graduation you must satisfy the general University requirements listed in "Academic Regulations," except, for Engineering students, those pertaining to group requirements. You must, in addition, satisfy the requirements of the prescribed curriculum of your major.

*Opportunity for Graduates.* Rapidly increasing industrial development, the need for control and development of natural resources, and rapid advances in transportation and communication assures a continuing strong demand for graduates in Engineering and the Industrial and Technical Arts and Sciences, and for teachers in these fields. Graduates of the Engineering College may expect ample opportunity for satisfying and remunerative professional employment.

*Professional Societies.* Professional association and advancement are promoted by activities of student branches of national professional societies. The following are represented, either by institutional membership, faculty membership, or student chapter: American Concrete Institute, American Geophysical Union, American Road Builders Association, American Society of Agricultural Engineers, American Society of Civil Engineers, American Society of Mechanical Engineers, American Society for Engineering Education, American Society of Tool and Manufacturing Engineers, the Institute of Radio Engineers, American Institute of

Electrical Engineers, American Vocational Association, American Industrial Arts Association, Society of Automotive Engineers, American Welding Society, and others.

You are encouraged to affiliate with the appropriate student chapter of these societies and participate in its activities.

*Honor Societies and Scholarships.* The Alpha Delta Chapter of Sigma Tau was installed at Utah State University in February, 1951. Membership is elected from junior and senior Engineering students whose scholarship is in the upper third of their class.

Graduating seniors in the upper ten percent of the class are eligible for membership in Phi Kappa Phi. Graduate Students may be elected to Sigma Xi, honorary scientific society.

A number of scholarships are available to Engineering students, including freshmen. Outstanding high school scholars should write directly to the Dean of the College of Engineering early in the senior year regarding these scholarships. (See "Scholarships, Fellowships, Awards" section in this catalog.)

*Common Freshman Curriculum in Engineering.* Except for a one-hour orientation course and a departmental elective, both in the spring quarter, all freshman curricula in Engineering are identical. While you are urged to make a tentative choice of your Engineering major upon entrance, a final decision may be deferred until spring quarter. Since the first two

years in any Engineering curriculum are very similar, you can change your major within this period without serious loss of time.

*ROTC.* Many Engineering College graduates have effectively served as reserve officers in the Armed Forces of the United States and the College is proud of this tradition. Participation in ROTC not only provides an opportunity to meet your military obligations but Junior and Senior ROTC students draw pay and allowances equivalent to a fine scholarship as well. Inactive reserve service after graduation may profitably be combined with your professional career. If you are called upon for active service in peace or war, ROTC training will fit you to take your place as an officer.

In order to assist and encourage Engineering students who desire to consider ROTC, the faculty has designated a special faculty adviser who will help you with your schedule and advise regarding other ROTC matters. This adviser is Associate Professor William L. Jones, Department of Electrical Engineering. Students in Industrial and Technical Education should contact the Head of the Department regarding ROTC.

*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. You should apply directly to the department concerned.

Department of

## Civil and Irrigation Engineering

(Civil, Irrigation, and Agricultural Engineering)

PROFESSORS *Cleve H. Milligan*, HEAD, *O. W. Israelsen*, EMERITUS, *A. Alvin Bishop*, *Jerald E. Christiansen*, *Vaughn E. Hansen*, *Harold R. Kepner*, *Dean F. Peterson*; ASSOCIATE PROFESSORS *William A. Cardon*, *Spencer H. Daines*, *Gordon H. Flammer*, *L. Elliot Rich*, *Guy O. Woodward*; ASSISTANT PROFESSORS *Bruce H. Anderson*<sup>1</sup>, *Jay M. Bagley*, *Von H. Jarrett*, *Jack Keller*, *Fred W. Kiefer*, *Willis A. Tingey*, *J. Donald Wadsworth*<sup>1</sup>; INSTRUCTORS *Don Budge*, *Vance T. Christiansen*; INSTRUCTOR AND PROJECT LEADER FOR UNIVERSITY-INDUSTRY FARM ELECTRIFICATION COMMITTEE *Paul Peterson*; IRRIGATION EXTENSION SPECIALIST *Terrel Tovey*; FARM BUILDINGS EXTENSION SPECIALIST *Wayne Ringer*; RESEARCH ASSOCIATE *Frank W. Haws*; COLLABORATORS *C. W. Lauritzen*, *Lyman S. Willardson*; RESEARCH ENGINEER *Earl Israelsen*.

### Office in E&PS 161

This department offers the Bachelor of Science degree in Civil Engineering and in Agricultural Engineering, and collaborates with the Agronomy Department in giving the Bachelor of Science degree in Irrigation and Soils.

*Major in Irrigation and Soils.* This joint major between the Departments of Agronomy and Civil and Irrigation Engineering is designed for students who wish to specialize in the management of land and water, in irrigation agriculture, without specializing in all of the technical engineering phases of irrigation. Extension specialists, certain civil service positions, and farm managers represent some types of employment available to graduates in this field.

An outline of courses with details concerning course requirements can be obtained from the Department of Agronomy or the Civil and Irrigation Engineering Department.

<sup>1</sup>On leave.

*Research Assistantships.* This department conducts engineering research through the Engineering and Agricultural Experiment Stations, and collaborates with the Agricultural Research Service, U. S. Department of Agriculture, in soil-water research. These research projects provide opportunities for qualified students to act as part-time research assistants and thereby obtain experience and compensation for their services. These projects also provide research opportunities for graduate students working on their theses.

### Civil and Irrigation Engineering

*Civil Engineering* consists of the economic application of the laws, forces, and materials of nature to the design, construction, and operation of engineering structures and projects, including irrigation and drainage systems, highways, railways, bridges, buildings, dams,

water supply systems, hydro-electric plants, and many other works which are a part of the requirements of civilization today.

With properly selected elective courses from the Civil and Agricultural Engineering you may obtain special training in Irrigation and Drainage Engineering in this department.

## Civil Engineering Curriculum

The Civil Engineering curriculum has been accredited by the Engineers Council for Professional Development.

Course	FRESHMAN	F	W	S
C.E. 1, 2, 3 .....		1	1	1
M.E. 21, 22, 23 .....		3	3	3
Math. 85 <sup>1</sup> , 46, 97 .....		5	5	5
Chem. 10, 11 or 3, 4 .....		5	5	....
Geology 3, or Chem. 12, or 5 .....		....	....	5
English 1, 2, 3 .....		3	3	3
M.S., A.S., or P.E. <sup>2</sup> .....		1	1	1
		18	18	18

Course	SOPHOMORE	F	W	S
C.E. 84, 82, 85 .....		4	4	3
C.E. 101 .....		....	....	4
Math. 98, 99, 110 .....		5	5	5
Physics 20, 21, 22 .....		5	5	5
Humanities <sup>3</sup> .....		3	3	....
M.S., A.S., or P.E. <sup>2</sup> .....		1	1	1
		18	18	18

Course	JUNIOR	F	W	S
C.E. 102, 103, 104 .....		4	4	4
C.E. 140, 141, 142 .....		3	3	3
E.E. 104, 105, 106 .....		3	3	3
M.E. 114, 115, .....		3	3	....
English 111 .....		....	....	3
Humanities .....		5	....	....
Humanities or C.E. 173 .....		....	5	....
C.E. 173 or Humanities .....		....	....	5
		18	18	18

Course	SENIOR	F	W	S
C.E. 105, 106, 107 .....		6	6	5
C.E. 150, 128, 195 .....		4	4	5
C.E. 198 .....		1	1	1
C.E. 146 or C.E. 193 .....		....	3	....
A.E. 145 or C.E. 194 .....		....	....	4
Technical Electives <sup>4</sup> .....		4	4	4
Humanities .....		3	....	....
		18	18	19

## Suggested Five-Year Curriculum in Civil Engineering

This curriculum is suggested if you wish to broaden your education, if you wish to take advanced military science or air science, or if you are deficient in entrance requirements.

You may wish to obtain a better foundation in mathematics, physics, or other branches of education. You may of necessity have to work a considerable amount of time to stay in school, or you may wish to participate in athletics or other extra-curricular activities. The five-year curriculum is designed to meet these special needs. If you desire the five-year curriculum you should consult your advisor to work out a satisfactory program.

Course	FIRST YEAR	F	W	S
C.E. 1, 2, 3 .....		1	1	1
Math. 34, <sup>1</sup> 85, 46 .....		3	5	5
Chem. 10, 11 .....		5	5	....
Geology 3 .....		....	....	5
English 1, 2, 3 .....		3	3	3
Plane Geometry <sup>1</sup> or elective .....		3	....	....
M.S., A.S., or P.E. <sup>2</sup> .....		1	1	1
		16	15	15

Course	SECOND YEAR	F	W	S
C.E. 84, 82, 85 .....		4	4	3
M.E. 21, 22, 23 .....		3	3	3
Math. 97, 98, 99 .....		5	5	5
Humanities <sup>3</sup> .....		3	3	3
M.S., A.S., or P.E. <sup>2</sup> .....		1	1	1
		16	16	15

Course	THIRD YEAR	F	W	S
Physics 20, 21, 22 .....		5	5	5
Math. 110 .....		5	....	....
Humanities <sup>3</sup> .....		3	5	5
C.E. 128, C.E. 101 .....		....	4	4
Adv. M.S. or A.S. .....		3	3	3
		16	17	17

<sup>1</sup>, <sup>2</sup>, <sup>3</sup>, <sup>4</sup> See footnotes page 128.



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### FOURTH YEAR

Course	F	W	S
C.E. 102, 103, 104 .....	4	4	4
C.E. 140, 141, 142 .....	3	3	3
E.E. 104, 105, 106 .....	3	3	3
M.E. 114, 115 .....	3	3	---
English 111 .....	---	---	3
Adv. M.S. or A.S. ....	3	3	3
	16	16	16

### FIFTH YEAR

Course	F	W	S
C.E. 105, 106, 107 .....	6	6	5
C.E. 195 .....	---	---	5
C.E. 146 or C.E. 193 .....	---	3	---
A.E. 145 or C.E. 194 .....	---	---	4
C.E. 198 .....	1	1	1
Technical Electives <sup>4</sup> .....	4	4	4
C.E. 150, 173 .....	4	5	---
	15	19	19

## Graduate Study

This department offers the *Master of Science degree* in Civil Engineering, Water Resources Engineering, Agricultural Engineering, and in Irrigation and Drainage Engineering. It also offers the *professional engineering degree* in *Civil Engineering and in Irrigation and Drainage Engineering*. The *Doctor of Philosophy degree* is offered in Agricultural Engineering (soil and water field), Civil Engineering, Irrigation and Drainage Engineering, and in collaboration with related departments the Doctor's degree in Irrigation Science is offered.

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 you are admitted 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.

Inasmuch as students enter with different backgrounds and with different objectives, no rigid curricula are suggested for advanced degrees. However, some typical programs of study are included for your information. By an appropriate selection of courses from the Agricultural Engineering, Civil Engineering and Agronomy fields a strong and rich program in Irrigation and Drainage may be developed both on an undergraduate and graduate level. These curricula must contain certain basic courses in mathematics and fundamental engineering subjects. As a graduate student, particularly at the doctorate level, you may obtain part of your work at other accredited universities upon approval of your Graduate Committee.

<sup>1</sup>If you are deficient in high school mathematics, Algebra B, register for Math. 34, Introduction to College Algebra, Fall Quarter. You will have the opportunity to make up mathematics deficiency during Summer Sessions between Freshman and Sophomore years. Otherwise you may choose the five-year curriculum. If you have not had high school plane geometry you must take this course without credit.

<sup>2</sup>Two credits are given for M.S. or A.S.

<sup>3</sup>You are required to earn a minimum of 19 credits in approved humanities. The following are recommended:

History 4, 5 or Psychology 53 and Cr. Hrs.  
Sociology 70 .....10  
English 34, 35, 36, Great Books and Ideas.... 9  
or Philosophy and Religion ..... 9  
or FAA 1, FADr 1, Fam 1 ..... 9  
You should obtain prior approval from your advisor and department head for any variations from this suggested program.

<sup>4</sup>Technical electives may be selected from the following: C.E. 120, 121, 122, 127, 130, 131, 132, 147, 181, 182; A.E. 143, 145, 148, 149, and 160; English 111; Geology 115 and 117; Advanced Mathematics or graduate courses with approval of instructor. (Courses will be taught only for classes of ten or more students.)

# Typical Programs of Study and Research<sup>1</sup>

## M.S. in Irrigation and Drainage

	F	W	S	Su
Math. 140, 141, 142.....	3	3	3	....
C.E. 260, 241, 242.....	4	4	4	....
A.E. 143, 147, 148.....	4	3	3	....
A.E. 145.....	....	....	4	....
C.E. 299, C.E. 298.....	1	2	....	10
	12	12	14	10

## M.S. in Civil Engineering (Fluid Mechanics)

	F	W	S	Su
Math. 130, 131, 132.....	3	3	3	....
C.E. 260, 241, 242.....	4	4	4	....
C.E. 211, 210, 273.....	3	3	3	....
C.E. 299, C.E. 298.....	1	2	2	8
C.E. 230.....	....	....	....	3
	11	12	12	11

## M.S. in Agricultural Engineering (Soil and Water field)

	F	W	S	Su
Math. 140, 141, 142.....	3	3	3	....
Agronomy 107, 165.....	5	3	....	....
A.E. 149, C.E. 210, A.E. 148....	4	3	3	....
A.E. 231, 232.....	....	3	3	....
A.E. 298.....	....	....	3	9
C.E. 299.....	....	....	1	....
	12	12	13	9

## PhD in Agricultural Engineering (Soil and Water)

1st Year				
	F	W	S	Su
Math. 130, 131, 132 .....	3	3	3	....
C.E. 260, 241, 242.....	4	4	4	x
Applied Statistics 130, 131, 215 .....	4	4	3	....
A.E. 143, 147, 148.....	4	3	3	....
C.E. 299.....	....	1	1	....
	15	15	14	....

## xA.E. 298-6 Languages

2nd Year				
	F	W	S	Su
Math. 140, 141, 142.....	3	3	3	x
Agronomy 107, 165, 214.....	5	3	3	....
Agronomy 106.....	4	....	....	....
A.E. 149, 160, 145.....	4	4	4	xx
A.E. 231, 232.....	....	3	3	....
A.E. 298.....	....	3	3	....
	16	16	16	....

## xA.E. 298-6 Languages xxComprehensive Exams

<sup>1</sup>Programs showing summer credit list only about 12 credits or less per quarter based on the assumption that you will hold a teaching or research assistantship.

	3rd Year	F	W	S	Su
Agronomy 155.....	....	3	....	....	....
Agronomy 219, 224.....	....	2	3	....	....
C.E. 245, 250.....	....	3	3	....	....
English 211, C.E. 210, 273.....	....	3	3	3	....
C.E. 298.....	....	10	3	3	....
C.E. 299.....	....	1	1	1	....
		14	15	13	....

As a candidate for an advanced degree you are given oral and/or written examinations to determine the adequacy of your preparation. You may be required to take additional course work where deficiencies are indicated by such examinations.

No guarantees can be made as to the time required to obtain any advanced degree. Ordinarily, however, a properly prepared student may obtain the Master's degree in one year and the Doctor's degree in three full years of study after the B.S. degree. Longer times are required if you have other employment. The time will depend entirely on your performance and your ability to satisfy your committee that you have earned the degree.

You may obtain additional information by contacting either the Civil and Irrigation Department or the Dean, School of Graduate Studies.

## M.S. in Water Resources Engineering

	F	W	S	Su
Math. 140, 141, 142.....	3	3	3	....
C.E. 260, 241, 242.....	4	4	4	....
W.R. 200, 201, 202.....	3	3	3	....
A.E. 149, Geology 117.....	4	4	....	....
C.E. 298.....	1	2	6	....
C.E. 299.....	1	....	....	....
	16	16	16	....

## PhD in Civil Engineering

(Hydraulics and Fluid Mechanics)

1st Year				
	F	W	S	Su
Math. 130, 131, 132.....	3	3	3	x
C.E. 260, 241, 242.....	4	4	4	....
Applied Statistics 130, 131, 215 .....	4	4	3	....
Math. 145, C.E. 273.....	....	3	3	....
English 211.....	3	....	....	....
C.E. 299.....	1	1	1	....
	15	15	15	....

xLanguages and Research C.E. 298-6

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## 2nd Year

	F	W	S	Su
Math. 254, 255, 256.....	3	3	3	x
C.E. 201, 202, 203.....	3	3	3	
C.E. 270, 271, 272.....	3	3	3	
Physics 153, 154, 155 (Vector Mech.).....	3	3	3	
C.E. 298.....	3	3	3	

15 15 15

xLanguages and Research Comprehensive  
Exams C.E. 298-6

## 3rd Year

	F	W	S	Su
Math. 257, 258, 259.....	3	3	3	
C.E. 211, 210, 250.....	3	3	3	
Approved Electives.....	3	3	3	
C.E. 298.....	3	3	3	

12 12 12

## Civil and Irrigation Engineering Courses

**1. Engineering Orientation.** A preview of engineering; what engineering is, what engineers do, what aptitudes 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, S) **Staff**

**3. Civil Engineering Orientation.** Engineering problems and lectures covering the various divisions of Civil Engineering. (1S) **Staff**

**80. Office Practice: For Foresters.** Practice in preparing office plans from forestry surveys. Prerequisite: C.E. 81 or equivalent. Two labs, one lecture. (3W) **Tingey**

**81. Plane Surveying.** Primarily for Forestry 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, S) **Tingey**

**82. Mapping and Office Practice.** Practice in mapping various kinds of engineering surveys. Prerequisite: C.E. 81 or 84. Two lectures, two labs. (4W) **Daines**

**84. Elements of Surveying.** Theory of surveying. Terminology, computations, areas, volumes, field astronomy, and general surveying. Prerequisites: Math. 35, 46. Two lectures, two labs. (4F) **Daines**

**85. Advanced Surveying.** Problems in leveling, curves, spirals, stadia, plane table, and city surveying. Prerequisites: C.E. 82 and C.E. 84. One lecture and 2 labs. (3S) **Daines**

**101, 102, 103, 104. Engineering Mechanics and Strength of Materials.** Includes statics, dynamics, and strength of materials. The following subjects are studied: resultants and equilibrium of force systems, friction, center of gravity, moments of inertia, kinematics and kinetics, stress and strain in tension and compression members, shafts, beams, columns, combined and principal stresses, fatigue, impact, energy loads, etc. Prerequisite: C.E. 2, Math. 99 and Physics 20. Three lectures and one lab. (4F, 4W, 4S, 4Su)

**Rich or V. Christiansen**

**105, 106, 107. Structural Theory and Design.** Introduces the analysis and design of structures and their elements. C.E. 105 and 106 cover stress analysis and design in steel, timber, and reinforced concrete. In C.E. 107 are given more comprehensive problems in the design of buildings and bridges. Prerequisites: C.E. 101, 102, 103, and 104. Fall and Winter quarters, recitation daily, one lab. Spring quarter, five recitations. (6F, 6W, 5S) **Kepner**

**120, 121, 122. Highway Engineering.** Fall quarter is devoted to general highway engineering, including current aspects of the federal highway engineering program, economics, financing, surveys and plans, geometric design of rural highways, and highway drainage. Winter quarter deals with the sub-grade structure, stabilized roads, materials of highway construction, and the design of flexible and rigid pavements. Spring quarter traffic problems, including the vehicle and the driver, traffic surveys, accidents, planning and design, traffic control, and regulations. Three lectures, one lab. (4F, 4W, 4S) **Cordon**

**127. City Planning.** Master plans, civic units, parks and playgrounds, utilities, housing, subdivisions, zoning, civic centers and airports. Three lectures. Prerequisite: C.E. 120. Two lectures, one lab. (3S) **Cordon**

**128. Engineering Materials.** The nature and properties of non-metallic and metallic engineering materials. Includes testing materials in accordance with ASTM standards. Three lectures, one lab. (4W) **Cordon**

**130. Building Construction and Cost Estimating.** Construction methods used in fabrication and creation of buildings and practice in estimating costs. Three lectures, one lab. (4F) **Budge**

**131, 132. Structural Design Problems.** Problems in deflection of beams and trusses, analysis and design of statically indeterminate trusses and rigid frames. Open to seniors and to graduate students in C.E. C.E. 103 is prerequisite for C.E. 131 and C.E. 105 and 106 are prerequisites for C.E. 132. Three lectures and one lab. (4W, 4S) **Kepner**

**140, 141, 142. Fluid Mechanics and Hydraulics.** Properties of fluids, the principles of hydrostatics, 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 and selection of tangential and reaction turbines and pumps. Prerequisites or concurrently: Physics 20, Math. 110. Fall, three lectures, Winter and Spring, two lectures and one lab. (3F, 3W, 3S) **Flammer, Keller**

**144. Applied Hydraulics and Pneumatics.** Theory and practice in hydraulics and pneumatics as they apply to machine tools and controls. Prerequisite: C.E. 140. Two lectures, one lab. (3W) **Hansen**

**146. Design of Water Conveyance Irrigation Structures.** Application of principles of solid, fluid, and soil mechanics to the solution of engineering designs for earth canals, lined canals, flumes, transitions, and pipe lines. Prerequisites: C.E. 142, 150; concurrently, C.E. 106. Three lectures. **Bishop**

**147. Design of Water Control Structures.** Design of dams, diversion works, drops and chutes, spillways, wasteways, headgates, and check gates. Prerequisite: C.E. 146. Three lectures. (3S) **Bishop**

**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: C.E. 103, 142. Three lectures, one lab. (4F) **Kiefer**

**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: C.E. 141, or instructor's consent. Four lectures, one lab. (5W, 5S) **Bagley**

**181. Photogrammetry.** The science or art of utilizing photographs of the earth's surface for making surveys, maps, and land utilization studies. Planimetric maps, mosaics and restituted photographs, their construction and uses. Prerequisites: E.D. 63, C.E. 81 or 85, or senior standing in Forestry, Range or Wildlife Management, Geology, Landscape Architecture, Aeronautics, or Advanced Military Science. Three lectures, one lab. (4W) **Tingey**

**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. (2S) **Tingey**

**191. Senior Project.** Research or testing project in some phase of engineering. You conduct minor research project under direction of faculty. Conducted cooperatively with C.E. 198 and English 111. (1W, 1S) **Staff**

**193. Municipal Water Systems.** Elements of design construction, and maintenance of waterworks systems. Treatment of public water supplies. Prerequisite: C.E. 142. Three lectures. (3W) **Bishop**

**194. Sewerage.** Principles of design, construction and maintenance of sewer systems. Treatment of sewage by physical, chemical and biological action and methods of final disposal. Prerequisite: C.E. 142. Three lectures, one lab. (4S) **Kepner**

**195. Contracts, Specifications and Engineering Economy.** Synopsis of the law of contracts. Writing of specifications. Financial and cost problems associated with engineering design, operation and construction. Determination of the economic alternatives in engineering. (5S) **Cordon**

**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, S) **Milligan**

All courses with 200 number or over are reserved for graduate students. Undergraduate senior students who have a high scholastic standing may register for them only with approval of the department.

**201, 202, 203. Advanced Structural Theory and Design.** Advanced topics in structural theory including analysis of indeterminate frame works; model analysis; individual problems in the design of modern structures. Prerequisites: C.E. 132, 201. Three lectures. (3W, 3S) **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: C.E. 150. (3W) **Milligan**

**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. Time arranged. Prerequisite: C.E. 103. (3F) **Rich**

**212. Appurtenances to Dams and Operation of Reservoirs.** Hydraulic and structural design of tunnels, gates, outlet channels, trash racks, etc. Operation of reservoirs for flood control and irrigation. Prerequisite: C.E. 142. (3S) **Staff**

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**215. Hydro-Electric Design.** Selection of plant capacity from hydrological information. Effect of storage on capacity. Economic height of dams. Selection of equipment. Layout and arrangement of power plants. Prerequisite: C.E. 142. Time arranged. (3W) **Staff**

**220, 221, 222. Advanced Highway Engineering.** Economics of location and design, selection, improvement and maintenance, traffic control, administration and finance, and jurisdiction as applied to highways. Prerequisite: C.E. 122. (3F, W, S) **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: C.E. 128 or equivalent. (3W or 3S) **Cordon**

**230. Special Problems in Civil, Irrigation or Drainage Engineering.** Independent study of a chosen problem under the direction of a member of the department staff. You are expected to develop your initiative in pursuing these problems. Formal typewritten reports required. Time and credit arranged. (F, W, S) **Staff**

**241. Intermediate Fluid Mechanics.** Effects of pressure, inertia, gravity, viscosity, compressibility, and surface tension on the motion of fluids. Surface resistance, form resistance, lift, and propulsion. Prerequisites: C.E. 142 or equivalent. (4W) **Hansen**

**242. Channel Flow.** Theory of uniform and varied flow in open channels with applications to design of hydraulic structures, backwater curves, drawdown curves, measuring flumes, hydraulic jump, and super-critical flow problems. Prerequisite: C.E. 241. (4S) **Flammer**

**243. Advanced Hydraulic Design.** Design of pipe lines, special flumes, spillways, water control structures, and hydraulic machinery. Prerequisites: C.E. 142, 147. (3S) **Staff**

**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**

**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: C.E. 150 or its equivalent. (3S) **Peterson**

**251. Advanced Soil Mechanics Laboratory.** Advanced laboratory work in soil mechanics to be arranged with instructor (1S) Prerequisites: C.E. 150 and 250 (may be taken concurrently) **Kiefer**

**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: Approval of instructor. (4F) **Watkins, Flammer**

**270, 271, 272. Advanced Fluid Mechanics.** Advanced topics in theoretical fluid mechanics and hydro dynamics. Prerequisite: C.E. 242, partial differential equations and advanced calculus. (3F, 3W, 3S) **Flammer**

**273. Advanced Hydrology.** Application of basic hydrologic principles to engineering investigations. Application of the unit hydrograph, infiltration analysis, hydrograph analysis, streamflow routing for reservoir operation and control, use and storage of groundwater. Prerequisite: C.E. 173. Three lectures. (3S) **Milligan**

**C.E. 280, 281. Theory and Design of Plates and Shells.** Analysis of stresses and deflections of various shaped plates and shells with applications to aircraft, roofs, tanks, and large pipelines. Prerequisites: C.E. 132 or equivalent and advanced engineering mathematics. (3W, 3S) **Staff**

**295. Sanitary Design.** Principles of design, construction and operation of water purification and sewage treatment plants. Prerequisites: C.E. 193, 194. (3W or S) **Kepler**

**298. Graduate Thesis.** Time and credit arranged. (F, W, S) **Staff**

**299. Graduate Seminar.** Time arranged. (1S) **Staff**

## Agricultural Engineering

*Agricultural Engineering* applies engineering science to the solution of agricultural problems in the areas of soil and water, farm buildings, farm power and machinery, electrification, and processing of agricultural products. The Agricultural Engineering curriculum at USU emphasizes irrigation and drainage and water supply and utilization.

Service courses are offered in farm mechanics, farm machinery, farm power, farm structures, mod-

## Agricultural Engineering 133

ern farm and home equipment, and irrigation and drainage. These service courses are open to all university students. They are particularly designed for students in Agriculture and Agricultural Education.

Academic work is supplemented by field trips, which you are required to take as a part of your course work. These field trips provide, under faculty guidance, firsthand study of engineering projects in different stages of completion.

The curriculum in Agricultural Engineering places special emphasis on irrigation and drainage and water supply and utilization. It is administered by the Civil and Irrigation Engineering Department, and qualified staff members listed in that department teach the courses in the curriculum.

### Agricultural Engineering Curriculum

Course	Freshman	F	W	S
C.E. 1, 2, A.E. 3.....		1	1	1
Math. 351, 46, 97.....		5	5	3
Chem. 16 and 11, or Chem. 3 and 4.....		5	5	....
Geology 3.....		....	....	5
M.E. 21, 22, 23.....		3	3	3
English 1, 2, 3.....		3	3	3
M.S., A.S. or P.E. <sup>2</sup> .....		1	1	1
		18	18	18

Course	Sophomore	F	W	S
Math. 98, 99, 110.....		5	5	5
Physics 20, 21, 22.....		5	5	5
C.E. 84, 101.....		4	....	4
Agronomy 56.....		....	4	....
Humanities <sup>3</sup> .....		3	3	3
M.S., A.S., or P.E.....		1	1	1
		18	18	18

Course	Junior	F	W	S
C.E. 102, 103, 104.....		4	4	4
C.E. 140, 141, 142.....		3	3	3
E.E. 104, 105, 106.....		3	3	3
M.E. 114, 115, English 111.....		3	3	3
Humanities <sup>3</sup> .....		5	....	5
C.E. 173.....		....	5	....
		18	18	18

#### Senior

Course	F	W	S
A.E. 143, 147, 148.....	4	3	3
A.E. 149, C.E. 146, A.E. 145.....	4	3	4
Farm Power and Machinery.....	....	....	5
Structures C.E. 105.....	6	....	....
C.E. 150, 128, 195.....	4	4	5
Agronomy 107.....	....	5	....
Agronomy 165.....	....	3	....
C.E. 198.....	1	1	1
	19	19	18

### Agricultural Engineering Courses

**1. Farm Mechanics.** Use of hand and power tools, sharpening, care, and selection of tools and shop supplies. Sheet metal work; cold metal; forge work; practical farm drawing; home farm shop; and shop safety. Three lectures, two labs. (5F, W) Jarrett

**10. Irrigation Practice.** Primarily for agricultural students. Principles and practices of efficient use of water, water measurement, farm surveying. Three lectures, one lab. (4S) Daines

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

<sup>1</sup>If you are deficient in high school mathematics, Algebra B, register for Math. 34, Introduction to College Algebra, Fall Quarter. You will have the opportunity to make up mathematics deficiency during Summer Sessions between Freshman and Sophomore years. Otherwise you may choose the five-year curriculum. If you have not had high school plane geometry you must take this course without credit.

<sup>2</sup>Two credits are given for M.S. or A.S.

<sup>3</sup>You are required to earn a minimum of 19 credits in approved humanities. The following are recommended: History 4, 5 or Psychology 53 and Sociology 70, 10 hours; English 34, 35, 36, Great Books and Ideas, 9 hours; or Philosophy and Religion, 9 hours; or FA-A 1, FA-Dr 1, FA-M 1, 9 hours. You should obtain approval from your advisor and department head for any variations from the suggested program.



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**103. Farm Machinery.** Selection, operation, maintenance, and repair of farm machinery, including materials of construction, mechanics, transmission of power, adjustment of tillage, planting, spraying, dusting, forage, and harvesting equipment, brazing cast iron, welding, hard facing, and use of the carbon arc torch. Three lectures, two labs. (5F) **Jarrett**

**108. Engineering Aspects of Soil and Water Conservation.** Extent and kinds of erosion, rate 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. (4W) **Daines**

**110. Irrigation Principles.** Primarily for upper division students in agriculture and colleges other than Engineering. 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. Prerequisite: C.E. 142. Three lectures, one lab. (4F) **Hansen**

**145. Design of Drainage Systems.** Drainage design in relation to soil properties, location of drains, flow of water, properties of tile, drainage construction, salinity of soil, and quality of water. Prerequisite: C.E. 142. Three lectures, one lab. (4S) **Bishop**

**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: Math. 98 and approval of instructor, or A.E. 143. (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 and sprinkling methods. Prerequisites: 143 and C.E. 142. (3S) **Bishop**

**149. Irrigation Institutions.** Laws governing acquisition, adjudication, and administration of water rights; state water codes, mutual companies, commercial companies, irrigation and drainage districts; federal legislation; project planning. (4F) **Milligan**

**160. Management of Irrigation Systems.** Details of staff organization for irrigation systems. Distribution of water to irrigators; financing for construction and operation; maintenance of canals, flumes, pipelines, dams, weirs, and other irrigation structures. (4W) **Milligan**

**230. Special Problems in Agricultural Engineering.** Independent study of chosen problems in Agricultural Engineering. You are expected to develop your initiative in pursuing these problems. Standard, formal typewritten reports required. Credit arranged. (F, W, S) **Staff**

**231, 232. 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. (3W, S) **Bishop, Milligan**

**298. Graduate Thesis.** Credit arranged. (F, W, S) **Staff**

Department of

## Electrical Engineering

PROFESSORS *Larry S. Cole*, HEAD, *Clayton Clark*, *Bertis L. Embry*<sup>1</sup>, *Bruce O. Watkins*; ASSOCIATE PROFESSORS *G. Smoot Horsley*, *William L. Jones*; ASSISTANT PROFESSORS *Doran J. Baker*, *Duane G. Chadwick*, *Robert L. Heyborne*; RESEARCH ENGINEERS *Arnold L. Finchum*, *Fon R. Brown*, *Clair L. Wyatt*.

## Office in Engineering and Physical Sciences 130

The four-year program listed here leads to the degree of Bachelor of Science, with emphasis in the field of general electronics.

The curriculum in Electrical Engineering is accredited by the Engineers' Council for Professional Development.

Laboratory work in small groups is an organized part of most courses, to provide physical confirmation of basic principles; familiarity with commonly used components, instruments and equipment; and to make possible closer relationships between teacher and student and among students.

If you plan to participate in the advanced military program, in athletics, work part-time, or if you desire a broader and less intense program, a five-year course of study leading to a B.S. degree is also available.

## Electrical Engineering Curriculum

Course	FRESHMAN			F	W	S
C.E. 1, 2	.....	1	1	.....		
E.E. 26	.....	.....	.....	1		
Math. 35, 46, 97	.....	5	5	5		
M.E. 21, 22, 23	.....	3	3	3		
English 1, 2, 3	.....	3	3	3		
Chem. 10, 11	.....	5	5	.....		
Humanity <sup>1</sup> or Elective <sup>2</sup>	.....	.....	.....	5		
M.S., A.S., or P.E. <sup>3</sup>	.....	1	1	1		
		18	18	18		

Course	SOPHOMORE			F	W	S
E.E. 79, 80, 81	.....	4	4	4		
Math. 98, 99, 110	.....	5	5	5		
Physics 20, 21, 22	.....	5	5	5		
History 1, 2, 3	.....	3	3	3		
M.S., A.S., or P.E. <sup>3</sup>	.....	1	1	1		
		18	18	18		

Course	JUNIOR			F	W	S
E.E. 124, 125, 126	.....	4	4	4		
E.E. 111, 112, 110	.....	3	3	4		
C.E. 101, 102, 103	.....	4	4	4		
Physics 122	.....	3	.....	.....		
M.E. 114, 115	.....	.....	3	3		
English 111	.....	.....	.....	3		
Humanities <sup>1</sup>	.....	3	.....	.....		
E.E. 150 <sup>4</sup>	.....	.....	2	.....		
		17	18	18		

Course	SENIOR			F	W	S
E.E. 139, 141	.....	3	4	.....		
E.E. 180, 181, 182	.....	4	4	4		
E.E. 107, 108, 160	.....	4	4	4		
E.E. 175, 176, 177	.....	1	1	1		
E.E. 151 or Elective <sup>4</sup>	.....	.....	2	2		
Elective <sup>2</sup>	.....	3	.....	4		
Humanities <sup>1</sup>	.....	3	3	3		
		18	18	18		

<sup>1</sup>May be selected from the following: History, Social Sciences, Literature, Philosophy, Fine Arts, and Non-Sectarian Religion.

<sup>2</sup>Electives must be approved by department head.

<sup>3</sup>Two credits are given for M.S. or A.S.

<sup>4</sup>May be taken any quarter, omitting a humanities course.

<sup>1</sup>On leave.

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## Graduate Study

The graduate program in Electrical Engineering is basically general, covering circuits, waves, and fields, with supporting mathematics and physics. Some specialization is available in the fields of radio propagation, servo-mechanisms, computer fundamentals, microwave measurements, transistor circuitry, and semiconductor physics.

A possible course of study is listed below which will lead to the Master of Science degree. Modification may be made, depending on your preparation and objectives.

Extended programs of study, in cooperation with the Departments of Physics, Mathematics, and Mechanical Engineering, may lead to the Engineer's and Doctor of Philosophy degrees in Electrical Engineering.

Typical course of study leading to the degree of Master of Science in Electrical Engineering:

Course	F	W	S	Su
E.E. 211, 212 .....	4	4	....	—
E.E. 232, 233 .....	....	3	3	....
E.E. 222, 223 .....	....	3	3	....
E.E. 298 (thesis) .....	....	....	3	7
Math. 130, 131, 132 or 140, 141, 142 .....	3	3	3	....
Approved Elective <sup>1</sup> .....	....	....	3	3
	10	13	12	10

## Electrical Engineering Courses

**21. Fundamentals of Electricity.** A service course for students in Industrial Arts, Automotive, Welding, etc. Basic principles of practical and applied electricity; DC and AC circuits; power; wire and wiring; motor, generator and transformer principles; batteries; meters. Prerequisite: Math. 34 or equivalent. Three lectures. (3F, W, S) **Staff**

**22. Fundamentals of Electricity, Lab.** A laboratory to accompany E.E. 21. Demonstrations and experiments on basic electric principles, circuits and equipment; problem sessions. One lab. (1F, W, S) **Staff**

<sup>1</sup>Recommended electives include modern physics, physical chemistry, nuclear science or other E.E. courses.

**26. Electrical Engineering Orientation.** An introduction to engineering principles and problems; the engineering profession; reports and communications. One lab. (1S) **Staff**

**79, 80, 81. Introduction to Electrical Engineering.** Fundamentals of Electrical Engineering: basic physical and electrical energy concepts; definitions, terminology, electrical energy sources. Application of Ohm's Law, Kirchhoff's laws, and network theorems to the solution of circuit problems. Non-linear circuit analysis. Introduction to magnetic and electric fields. Introduction to transient behavior. Fundamentals of alternating current; applications of complex quantities in AC circuits; applications of network theorems in AC circuits. Single phase and multi-phase circuits; AC power and reactive volt-amperes. Elements of complex wave analysis. Alternating currents in non-linear circuits. Prerequisites: E.E. 79, concurrent registration in Math. 98, (calculus) and slide rule proficiency; E.E. 80, Math. 98, E.E. 79 and concurrent registration in Math. 99; E.E. 81, Math 99 and E.E. 80. Three lectures, one lab. E.E. 79 (4F), E.E. 80 (4W), E.E. 81 (4S) **Heyborne**

**101. Electronics.** A special course for senior or graduate science majors and non-electrical engineers. Fundamentals of electric and electronic circuits; applications to the electrical measurement of physical quantities. Prerequisites: Physics 21 and elementary calculus. Three lectures, one lab. (4F) **Jones**

**104. Fundamentals of Electrical Engineering—Circuits.** For non-electrical engineers. Principles and analysis of DC and AC circuits. Electric and magnetic fields and circuits. Prerequisites: Physics 21 and Calculus. Two lectures, one lab. (3F) **Heyborne**

**105. Fundamentals of Electrical Engineering—Machines.** A continuation of E.E. 104. Principles of DC and AC machines. Generation, transmission and utilization of electric power. Transformers and protective equipment. Two lectures, one lab. (3W) **Heyborne**

**106. Fundamentals of Electrical Engineering—Electronics.** A continuation of E.E. 104 and 105. Industrial electronic systems and devices. Electrical methods of measurements of physical quantities. Two lectures, one lab. (3S) **Heyborne**

**107. Electrical Machinery I.** An introductory course covering the basic principles of electrical machinery; magnetic circuits; DC machines; AC power circuits, polyphase circuits, power transmission and distribution. Prerequisite: E.E. 81. Three lectures, one lab. (4F) **Watkins**

**108. Electrical Machinery II.** A continuation of E.E. 107, with special emphasis on AC

## Electrical Engineering 137

machines. Transformers; single and polyphase systems and machines; control equipment. Prerequisite: E.E. 107. Three lectures, one lab. (4W) **Watkins**

110. **Lines and Filters.** Principles and characteristics of transmission lines, networks, matching sections and filters. Prerequisite: E.E. 111. Three lectures, one lab. (4S) **Cole**

111. **Network Analysis I.** Basic network conventions and topology; formulation of network equations; solutions via differential equation, Laplace transform and operational methods. Prerequisites: E.E. 81 and Math. 110. Three lectures. (3F) **Cole**

112. **Network Analysis II.** A continuation of E.E. 111; impedance and admittance functions; network functions, driving point and transfer immittances; steady state analysis from pole-zero configurations; amplifier networks. Prerequisite: E.E. 111. Three lectures. (3W) **Cole**

120. **Antennas.** Fundamentals of antennas, radiation and wave propagation; directional arrays; feed lines and matching and phasing networks; antenna and field strength measurements. Prerequisites: E.E. 110, 139. Three lectures, one lab. (4S) **Clark**

124. **Fundamentals of Electronics.** Analysis of the principles, characteristics and operation of electronic devices utilizing basic physical laws and concepts of modern physics. Includes study of thermionic emission, vacuum and gas tubes, photoelectricity, semi-conductors and transistors. Prerequisites: E.E. 81, Math. 110; concurrent registration in Physics 122 is desirable. Three lectures, one lab. (4F) **Chadwick**

125. **Electronic Circuits I.** Principles, analysis and design of tube and transistor voltage amplifiers; feedback principles and feedback amplifiers. Prerequisite: E.E. 124. Three lectures, one lab. (4W) **Chadwick**

126. **Electronic Circuits II.** Principles, analysis and design of tube and transistor power amplifiers; RF power amplifiers and oscillator; modulation and detection systems. Prerequisite: E.E. 125. Three lectures, one lab. (4S) **Chadwick**

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: E.E. 111, 125. Three lectures, one lab. (4S) **Cole**

139. **Fundamentals of Electric Waves.** Introduction to vector analysis; elementary electro-magnetic field theory; Maxwell's equations; radiation and wave guides. Prerequisites: E.E. 110 and Math. 110. (3F) **Clark**

141. **Microwaves.** Fundamental principles of microwaves, generators, cavity resonators; transmission lines, wave guides, parabolic and horn radiators; microwave propagation; measurements in the microwave region. Prerequisite: E.E. 139. Three lectures, one lab. (4W) **Clark**

150. **Instruments and Measurements.** The principles and application of electrical and electronic instruments; methods and techniques of measurements. Prerequisite or concurrent registration in E.E. 124. One lecture, one lab. (2F) **Heyborne, Chadwick**

151, 152, 153. **E.E. Project Laboratory.** 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, 2S) **Staff**

160. **Servomechanisms.** Introductory theory and analysis of linear closed-loop control systems. Study of servomechanism systems containing electronic, electro-magnetic and mechanical components. Prerequisites: E.E. 107, 108, 112. Three lectures, one lab. (4S) **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. Prerequisites: E.E. 111, Math. 110. One lecture, one lab. (2F, 2W, 2S) **Watkins**

167. **Digital Computers.** Arithmetic operations in digital computers; survey of storage, switching, and input-output devices in computers; data processing and programming fundamentals. Prerequisites: Math. 35 and Upper Division or Grad. Status. Two lectures. (2F, 2W, 2S) **Watkins**

175, 176, 177. **Electrical Engineering Seminar.** A weekly meeting of staff and senior E.E. majors. Reports and discussions on recent developments in electronics and communications. Each student prepares and presents technical papers on suitable topics. (1F, 1W, 1S) **Staff**

180. **Transistors.** An introduction to the theory, principles and characteristics of transistors. Fundamental applications of transistors; circuitry, analysis and design. Prerequisite: E.E. 112, 125. Three lectures, one lab. (4F) **Jones**

181, 182. **Pulse and Digital Circuits.** Analysis and design of low pass and band pass amplifier circuits utilizing tubes and transistors. The use of tubes and transistors in static

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and regenerative switching circuits including pulse shaping circuits, multivibrator and blocking oscillator circuits. An introduction to counters, shift-registers, logic circuits, and information storage devices used in digital systems. Prerequisites: E.E. 180, 112. Three lectures, one lab. (4W, 4S) **Jones**

**200. Special Studies in Electrical Engineering.** Preparation of professional papers and reports, research, and special problems. Credit arranged. (F, W, S) **Staff**

**211, 212. Advanced Electronic Circuits.** Designed for graduate students who have completed a series of courses on pulse circuits using both tubes and transistors, such as E.E. 181, 182. The coverage is somewhat similar except that in this graduate series the emphasis is on analytical methods and development of more advanced pulse and digital techniques. Prerequisites: E.E. 180, 181, 182 or equivalent. Three lectures, one lab. (4F, 4W) **Clark**

**222, 223. Network Synthesis.** The mathematical basis and design methods for two and four-terminal passive networks having physically realizable driving point immittances. Prerequisite: E.E. 112. (3F, 3W) **Watkins**

**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 139 or Physics 175. Three lectures (3W, 3S) **Baker**

**235. Radio 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 magnetoionic theory. Prerequisite: E.E. 139 or equivalent. (3Su) **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: E.E. 139, 141 or equivalent. One lecture, one lab. (2Su) **Staff**

**245. Introduction to Semiconductor Device Theory.** Basic principles of semiconductor theory; p-n junction and transistor theory; survey of new devices. Three lectures, 1 lab. (4Su) **Horsley**

**251. Servomechanisms and Automatic Controls.** Advanced theory and design of linear servo systems. Feed-back synthesis. Transient response and stability problems. Introduction to non-linear systems. Prerequisite: E.E. 160 or equivalent. Three lectures, one lab. (4S) **Watkins**

**275, 276, 277. Graduate E.E. Seminar.** A weekly meeting of staff and graduate E.E. students. Each student prepares and presents technical papers on suitable topics. One lecture. (1F, 1W, 1S) **Staff**

**298. Graduate Thesis.** Credit arranged. (F, W, S) **Staff**

Department of

# Mechanical Engineering

(Mechanical Engineering, Chemical Engineering)

PROFESSORS *Reynold K. Watkins*, HEAD, *Bertis L. Embry*<sup>1</sup>; ASSOCIATE PROFESSORS *Izydor Eisenstein*, *Austin G. Loveless*<sup>1</sup>; ASSISTANT PROFESSORS *Russell M. Holdredge*, *Albert B. Smith*<sup>1</sup>, *Edward W. Vendell*, *Carl R. Wallis*; INSTRUCTOR *Ross A. Nyman*; RESEARCH ENGINEER *Fred J. Donkin*; RESEARCH ASSISTANT *F. Dwayne Nielson*.

## Office in Engineering and Physical Science 170

Mechanical engineering is the design and development of machines. Machines can be anything from a crowbar to an inter-planetary rocket. Most of the technical staffs of industries, public utilities, and government agencies include mechanical engineers. Mechanical engineers specialize in such areas as aeronautics, automotive engineering, nuclear engineering, petroleum, industrial engineering, space engineering, thermodynamics, heat transfer, machine design, power production, systems engineering, management, sales, refrigeration, air conditioning, etc.

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. Because of the increasingly vast diversification of specialization, emphasis is placed on basic engineering fundamentals such as mathematics, chemistry, physics, and basic engineering sciences. On graduation the student is qualified to become an engineer-in-training in a specialized area in industry or to continue specialization in graduate study.

Laboratory facilities are available

for student use including a subcritical reactor for those interested in nuclear engineering.

The engineering drawing sequences provide instruction in the various aspects of drafting and graphics for all departments in the University. Non-engineering students may qualify for a minor in engineering (mechanical) drawing on completion of 18 credits consisting of M.E. 21, 22, 23, and such other courses as are approved by the department faculty.

Industrial management students may obtain a minor in a specialized area of power or design by completing a total of 18 credit hours in courses approved by the department faculty.

<sup>1</sup>On leave.

## Mechanical Engineering Curriculum

FRESHMAN			
Course	F	W	S
Chem. 10, 11, 12 .....	5	5	5
M.E. 21, 22, 23 .....	3	3	3
Math. 35 <sup>2</sup> , 46, 97 .....	5	5	5
English 1, 2, 3 .....	3	3	3
C.E. 1, 2 .....	1	1	—
M.E. 3 .....	—	—	1
M.S., A.S., or P.E. <sup>3</sup> .....	1	1	1
	18	18	18

<sup>2</sup>See footnote page 140.

<sup>3</sup>See footnote page 141.



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## SOPHOMORE

Courses	F	W	S
Physics 20, 21, 22 .....	5	5	5
Math. 98, 99, 110 .....	5	5	5
TME 148, 150.....	3	4	....
C.E. 101 .....	....	....	4
History 1, 2, 3 .....	3	3	3
M.E. 4 .....	1	....	....
M.S., A.S., or P.E. <sup>3</sup> .....	1	1	1
	18	18	18

## JUNIOR

Courses	F	W	S
M.E. 114, 115 .....	3	3	....
C.E. 102, 103, 104 .....	4	4	4
E.E. 104, 105, 106 .....	3	3	3
C.E. 140, 141.....	3	3	....
M.E. 143 .....	....	....	4
M.E. 120 .....	3	....	....
M.E. 130.....	....	3	....
M.E. 160 .....	....	....	4
Humanities <sup>4</sup> .....	3	3	3
	19	19	18

## SENIOR

Courses	F	W	S
M.E. 117, 118, 119.....	4	4	4
M.E. 131, 132, 133.....	4	4	4
M.E. 143.....	4	....	....
M.E. 160, 161.....	3	4	....
M.E. 165.....	....	....	3
M.E. 198.....	1	1	1
Technical Electives <sup>5</sup> .....	3	3	3
Humanities <sup>4</sup> .....	....	3	....
Speech 105.....	....	....	3
	19	19	18

## Suggested Five-Year Curriculum in Mechanical Engineering

This curriculum is suggested if you have deficiencies that cannot be made up during the summer or if you wish to include additional activities such as participation in extra-curricular activities, a dual major, or employment.

## First Year

Courses	F	W	S
C.E. 1, 2.....	1	1	....
M.E. 3.....	....	....	1
Math. 34, 35, 46.....	3	5	5
Chem. 10, 11, 12.....	5	5	5
English 1, 2, 3.....	3	3	3
Plane Geometry or elective .....	3	....	....
M.S., A.S., or P.E. <sup>3</sup> .....	1	1	1
	16	15	15

## Second Year

Courses	F	W	S
TME 148, 150.....	3	4	....
M.E. 21, 22, 23.....	3	3	3
Math. 97, 98, 99.....	5	5	5
History 1, 2, 3.....	3	3	3
M.S., A.S. or P.E. <sup>3</sup> .....	1	1	1
C.E. 101.....	....	....	4
M.E. 4.....	1	....	....
	16	16	16

## Third Year

Courses	F	W	S
Physics 20, 21, 22.....	5	5	5
Math. 110.....	5	....	....
C.E. 102, 103, 104.....	4	4	4
Humanities <sup>4</sup> .....	....	3	....
M.E. 130 .....	....	....	3
M.E. 160 .....	....	....	4
M.E. 130.....	....	....	3
Adv. M.S. or A.S. <sup>6</sup> .....	3	3	3
	17	18	16

## Fourth Year

Courses	F	W	S
M.E. 114, 115, 116.....	3	3	3
E.E. 104, 105, 106.....	3	3	3
C.E. 140, 141.....	3	3	....
M.E. 161 .....	4	....	....
M.E. 143 .....	....	....	4
Humanities <sup>4</sup> .....	....	3	3
Adv. M.S. or A.S. <sup>6</sup> .....	3	3	3
	16	15	16

## Fifth Year

Courses	F	W	S
M.E. 131, 132, 133.....	4	4	4
M.E. 161 .....	4	....	....
M.E. 116, 117, 119 .....	4	4	4
Humanities <sup>4</sup> .....	3	3	3
M.E. 198 .....	2	2	2
Technical Electives <sup>5</sup> .....	....	4	4
	17	17	17

<sup>2</sup>If you are deficient in high school mathematics, Algebra B, register for Math 34, Introduction to College Algebra, Fall Quarter. You will have the opportunity to make up mathematics deficiency during Summer Sessions between Freshman and Sophomore years. Otherwise you may choose the five-year curriculum. If you have not had high school plane geometry you must take this course without credit. In future catalogs, starting with 1962-1963, Trigonometry and College Algebra will also be prerequisites for Freshman Engineering Students. Deficiencies will then make it necessary for you to register in a pre-engineering curriculum until these deficiencies are removed.

3, 4, 5, <sup>6</sup>See footnotes page 141.

## Graduate Study

This department offers a graduate program leading to the Master of Science degree in Mechanical Engineering. The program is designed for specialization in applied mechanics, thermodynamics, or nuclear engineering. It is understood that: (1) an acceptable course of study will be worked out by the student with a graduate committee which will be appointed by the Dean of the School of Graduate Studies; (2) the study and research program will satisfy all of the requirements listed in this catalog under the School of Graduate Studies. In addition to the prescribed requirements, a minimum of 9 credit hours of mathematics beyond that required for the B.S. is required. Ordinarily the advanced calculus series is recommended.

Following is a typical course of study leading to the degree of Master of Science in Mechanical Engineering:

Course	F	W	S	Su
Math. 130, 131, 132.....	3	3	3	
M.E. 210, 211, 214.....	3	3	4	
M.E. 240, 241, 242.....	3	3	3	
M.E. 261.....		5	....	
M.E. 230.....		....	3	
C.E. 260.....	4	....	....	
M.E. 298.....	....	....	....	9

13 14 13 9

Depending on the student's specialization some of the above courses may be replaced by such courses as: M.E. 201, 202, 203; C.E. 201, 202, 203; C.E. 270, 271, 272, and C.E. 241.

<sup>3</sup>Credits for M.S. I and II (2F, 2W, 2S) and credits for A.S. I are (1F, 1W, 2S) and for A.S. II are (2F, 2W, 1S).

<sup>4</sup>You are required to earn a minimum of 27 credits in approved humanities including History 1, 2, and 3 and Economics. Any one of the following sequences is required: Psychology 53 and Sociology 70, 10 hours; English 34, 35, 36, Great Books and Ideas, 9 hours; FA-A 1, FA-Dr 1, FA-M 1, 9 hours; or Philosophy and Religion, 9 hours. All elective

## Mechanical Engineering Courses

**3. Mechanical Engineering Problems.** Methods of solving and presenting problems in an engineering manner. Numerical and graphical solutions of algebraic and trigonometric equations. Prerequisite: C.E. 2. One lab. (1S) **Watkins**

**4. Machine Computation Methods.** Use of electric calculators, punch card, and electronic computers in engineering calculations. One lab. (1F) **Watkins**

**Note:** Do not purchase drafting instruments before first class in the next six courses:

**6. Elementary Drafting.** Lettering, use of instruments, and fundamentals of drafting. Open only to forestry students. One lab. (1W) **Smith**

**19. Aircraft Drawing.** Aircraft drafting techniques, numbering systems, change methods, and technical specifications. Prerequisite: M.E. 13 or M.E. 23. One lecture, two labs. (3S) **Smith**

**21. Engineering Graphics.** Development of spatial visualization. Graphical solutions involving points, lines, and planes. One lecture, two labs. (3F, W) **Staff**

**22. Engineering Graphics.** Revolutions, intersections, and developments, vectors, alignment charts, graphs, and pictorial drawings. Prerequisite: M.E. 21. One lecture, two labs. (3W, S) **Staff**

**23. Engineering Graphics.** Conventional representations, dimensioning, and working drawing in the following areas: machine, structural, electrical, and piping. Prerequisite: M.E. 22. One lecture, two labs. (3F, S) **Staff**

**105. Special Problems in Drawing.** This course is intended to give upper division students an opportunity to work in special areas of architectural drawing, perspective drawing, production illustration, machine and sheet metal drawing, and other areas as approved by the head of the department. Prerequisite: M.E. 23. Credit arranged. (F, W, S) **Wallis**

humanities courses and any variation from the recommended program must be approved by the department faculty.

<sup>5</sup>Technical electives may be selected from the following sequences: Math. 130, 131, 132; Math. 140, 141, 142; M.E. 190, 191, 192; or from the following courses after consultation with your adviser: M.E. 106, 135, 162, 165, 172, 183, 185, 187.

<sup>6</sup>Optional

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**106. Machine Frame Analysis.** An introduction to methods of design of statistically indeterminate machine frames. Prerequisite: C.E. 104. Three lectures. (3F) **Watkins**

**110. Heat Engines.** Introduction to elementary thermodynamics and basic heat power cycles. Prerequisite: Physics 19. Three lectures, one lab. (4W) **Staff**

**114, 115. Engineering Thermodynamics.** First Law, Second Law, Heat, Work, Pure Substance, Perfect Cases, Mixtures, Applications, Available Energy, and Introduction to Heat Transfer. Prerequisites: M.E. 114; Math. 110, Physics 22; M.E. 115; M.E. 114. M.E. 114 and 115 cannot be taken concurrently. Three lectures. M.E. 114 (3F, 3W), M.E. 115 (3W, 3S) **Holdredge, 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: M.E. 115, 160 and C.E. 141. Classes must be taken in sequence. Three lectures, one lab. (4F, 4W) **Holdredge**

**119. Thermodynamic Systems.** Application of the laws, concepts, and procedures of thermodynamics, heat transfer, and gas dynamics to turbo-machinery, propulsion, combustion, gas and vapor turbine cycles, expanders and compressors, and other apparatus. Both analytical and experimental approaches. Prerequisites: M.E. 117 and 143. Three lectures and one lab. (4S) **Holdredge**

**120. Mechanical Engineering Measurements.** Basic mechanical engineering measurement, methods, comparisons and procedures. Prerequisite: concurrently with M.E. 114, C.E. 140. Two lectures, one lab. (3F) **Holdredge**

**130. Kinematics.** Analysis of displacement, velocity and acceleration in mechanisms by graphical and analytical methods. Velocity and acceleration polygons and diagrams. Kinematic design of cams, belts, toothed gearing, gear trains, and miscellaneous mechanisms. Synthesis of mechanisms. Prerequisite: C.E. 102. Two lectures, one lab. (3F, 3W) **Eisenstein**

**131. Machine Design I.** Application of principles of mechanics, strength of materials and kinematics to the design of basic machine elements. Combined stresses, theories of failure. Variable loads—repeated and impact—as applied to machine elements. Stress concentration. Design of fastenings, screws for power transmission and pressure vessels. Prerequisites: C.E. 104, M.E. 130. Three lectures, one lab. (4F) **Eisenstein**

**132. Machine Design II.** Analysis of static and dynamic forces and stresses in machine elements. Main topics are: design of springs, power transmission equipment, shafting, couplings, clutches and brakes, bearings with sliding and rolling contact, lubrication. Vibrations, deflections, and critical speeds of shaft. Prerequisite: M.E. 131. Three lectures, one lab. (4W) **Eisenstein**

**133. Machine Design III.** Design of belt and chain drives, gearing, flywheels, etc. Design of mechanical systems involving stress analysis and dynamics. Introduction to advanced topics. Prerequisite: M.E. 132. Three lectures, one lab. (4S) **Eisenstein**

**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. Prerequisite: M.E. 130 and C.E. 103. Three lectures, one lab. (4W) **Eisenstein**

**135. Dynamics of Machinery.** Analysis of motion arising from vibrations of systems of one or more degrees of freedom; free and forced vibrations. Application of theory to practical problems of rotating and reciprocating machines; balancing of machinery. Analysis of dynamic forces in machinery. Two lectures and 1 lab. (3S) **Eisenstein**

**143. Gas Dynamics.** Fundamental concepts of fluid mechanics and thermodynamics, isentropic flow, shock waves constant area flow, flow with heating, centralized one dimensional flow. Prerequisites: M.E. 114, C.E. 102, and C.E. 141. Three lectures, one lab. (4S) **Holdredge**

**160. Theoretical Mechanics.** The theoretical analysis of stresses and strains in an elastic material due to dynamic as well as static loading conditions. Three lectures. (3F) **Vendell**

**161. Mechanical Vibrations I.** Analysis of undamped, damped, and forced vibrations of systems with one, two, and many degrees of freedom. Introduction to numerical vibrations analysis and electro-mechanical analogies. Three lectures. (4W) **Vendell**

**162. Mechanical Vibrations II.** Vibration analysis of systems within degrees of freedom, numerical analysis methods, and miscellaneous topics such as beams, plates, shells, and fatigue. Four lectures. (4S) **Vendell**

**165. Advanced Mechanics of Materials.** Development of various theories of failure and stress-strain relationships as they apply to problems of direct and shearing loads, flex-

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ure, 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 C.E. 104. Four lectures. (4S)

Watkins

**172. Analytical and Graphics Methods.** Analysis of mass data encountered in engineering operations and research. Selected statistical methods and graphical presentation useful in reports for management. Prerequisites: Math. 99 and M.E. 170. Three lectures. (3W)

Watkins

**183. Refrigeration and Air Conditioning.** Principles of heating, ventilating, and cooling systems. Psychometric processes. Basic refrigeration processes. Prerequisite: M.E. 116. Three lectures, one lab. (4S)

Staff

**185. Rocket Engines.** Basic principles of rocket engines including control mechanisms for both solid and liquid propellant engines. Prerequisite: Chem 12, and M.E. 160 or concurrent registration for M.E. 160. M.E. 143 and M.E. 116. Three lectures. (4F)

Staff

**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: M.E. 116. Three lectures. (3S)

Staff

**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; types of reactors. Three lectures, one lab. (4W, 4S, 4F)

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. (2F, 2W, 2S)

Watkins

**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, 3W, 3S)

Staff

**201. Theory of Elasticity.** The inter-relationship of stresses and/or strains, properties of the material, and the configuration of an elastic media under a given load. Prerequisites: C.E. 104, M.E. 160. Five lectures (5W)

Watkins

**202. Theory of Plasticity.** The analysis of stresses, deformation, and collapse in devices constructed of plastic material. Prerequisites: Math. 110, C.E. 104. Five lectures. (5S)

Watkins

**210, 211. Transport Phenomena.** Systematic and parallel treatment of momentum transport (viscous flow), energy transport (conduction, convection, and radiation), and mass transport (diffusion). Treatment will stress similarities between the three phenomena. Applications to complex engineering systems. Prerequisite: M.E. 143. Three lectures. (3F, 3W, 3S)

Holdredge

**214. Intermediate Thermodynamics.** Advanced First and Second Law Topics. Complex Equations of State, Property Determination, and Mathematics of Thermodynamics. Prerequisite: M.E. 143 and M.E. 117. (Note: May be taken as undergraduate elective with instructor's approval.) Four lectures. (4S)

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: M.E. 130. Three lectures. (3S)

Eisenstein

**240, 241, 242. Intermediate Gas Dynamics.** Intermediate topics in the flow of compressible fluids, shock, boundary, layer theory, flow tables, thermodynamic considerations. Prerequisites: M.E. 117 and M.E. 143. Three lectures. (3F, 3W)

Holdredge

**261. Advanced Vibrations.** Analysis of mechanical vibrations in elastic media by numerical methods, models and analogies. Five lectures. (5W)

Vendell, Watkins

**298. Graduate Thesis.** Credit arranged. (F, W, S)

Staff

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### Department of

# Tool and Manufacturing Engineering

PROFESSOR *Frederick Preator*, HEAD; ASSISTANT PROFESSORS *Rawson D. Child*, *W. Karl Somers*.

### Office in Mechanical Arts 101

This department offers a four-year course leading to the degree of Bachelor of Science in Tool and Manufacturing Engineering.

This branch of engineering is devoted primarily to planning the processes of economic manufacture; the art and science of analyzing, planning, designing, construction, and producing manufacturing facilities. The Manufacturing Engineer works closely with research and development, product engineering, methods engineering, machine design, tool design, plant layout engineering, gage engineering, and manufacturing cost estimating.

National surveys indicate that large numbers of engineers are needed in manufacturing engineering. As industrial production expands in our own state and across the nation, increasing opportunities are becoming available. The demand for Tool and Manufacturing Engineers is greater than the supply.

*Facilities.* The Tool Engineering Laboratories, the Heat Treatment, Inspection and Senior Students' design room are all equipped with modern facilities for teaching, for engineering experimentation, and for student development in Manufacturing Engineering.

A program of cooperative training with Utah industries has been worked out for advanced students which permits registration for summer periods. Field trips to industrial plants are conducted

each year for junior and senior students.

Student Chapter No. 2 of the American Society of Tool and Manufacturing Engineers promotes the professional and social interests of its engineering majors. Members of the teaching staff are members of the national society.

### Tool and Manufacturing Engineering Curriculum

FRESHMAN				
Course	F	W	S	
C.E. 1, 2.....	1	1	....	
T.M.E. 50.....	....	....	1	
T.M.E. 56.....	....	....	3	
Math. 35, <sup>1</sup> 46, 97.....	5	5	5	
English 1, 2, 3.....	3	3	3	
M.E. 21, 22, 23.....	3	3	3	
Chem. 10, 11.....	5	5	....	
P.E., M.S., or A.S.....	1	1	1	
	18	18	16	
SOPHOMORE				
Course	F	W	S	
Math. 98, 99, 110.....	5	5	5	
Physics 20, 21, 22.....	5	5	5	
T.M.E. 57, 52, 53.....	3	3	3	
Welding 97.....	3	....	....	
Humanities .....	....	5	5	
P.E., M.S., or A.S.....	1	1	1	
	17	19	19	
JUNIOR				
Course	F	W	S	
T.M.E. 151, 152, 153.....	4	4	4	
T.M.E. 150, 148.....	....	4	3	
C.E. 101, 102, 103.....	4	4	4	
E.E. 104, 105, 106.....	3	3	3	
M.E. 114.....	3	....	....	
Humanities .....	3	3	3	
	17	18	17	

<sup>1</sup>See footnote page 145.

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### SENIOR

Course	F	W	S
T.M.E. 158, 180, 183.....	3	3	3
T.M.E. 181, 182.....		5	5
T.M.E. 184.....	2	....	....
T.M.E. 187, 188.....		2	2
M.E. 130, 134.....	3	4	....
C.E. 140, 144.....	3	3	....
English 111.....	3	....	....
B.A. 170.....	....	....	3
Electives <sup>2</sup> .....	3	....	3
	17	17	16

## Tool and Manufacturing Engineering Courses

**50. Orientation.** Lectures, and films to acquaint the student with the work of the tool and manufacturing engineer. (1S) **Staff**

**51. Machine Tool Operation.** Training in use of hand tools, together with elementary training in drill press and engine lathe operations. Reading assignments on machine tool operations and applications of mathematics to machine tool problems. Two lectures, two labs. (4F) **Child, Somers**

**52, 53. Production Processes.** Shaper, milling, and grinding operations. Prerequisite: T.M.E. 51 or 56. Two lectures, one lab. (3W, S) **Staff**

**56. Machine Lab for Engineers.** Acquaints the student with basic machine tool operations. Two lectures, one lab. (3F, W, S) **Staff**

**57. Inspection and Control of Quality.** A study of the theory and practice of precision measurements, inspection methods, and control of quality of the manufactured product. Prerequisite: Math. 44 or 46. (3F) **Somers**

**148. Manufacturing Processes.** Fundamentals of manufacturing processes; shows possibilities and limitations of these processes and their application to fabrication of industrial products. (3W, S) **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

If you are deficient in high school mathematics, Algebra B, register for Math. 34, Introduction to College Algebra, Fall Quarter. You will have the opportunity to make up mathematics deficiency during Summer Sessions between Freshman and Sophomore years. Otherwise you may choose the five-year curriculum. If you have not had high school plane geometry you must take this course without credit.

<sup>2</sup>Electives must be approved by department

of applications in industry are reviewed. Prerequisite: Chem. 10. Three lectures, one lab. (4F, W, S) **Preator**

**151. Tooling Systems - Operations.** Develops an understanding of the capacity and versatile usefulness of the fundamental machines and equipment used in manufacturing engineering. Prerequisite: T.M.E. 53. Two lectures, two labs. (4F) **Child**

**152. Tooling Systems - Planning.** Deals with the analysis of the product design, planning procedures, routing methods, and the organization of the operational sequence. Prerequisites: T.M.E. 151. Two lectures, two labs. (4W) **Child**

**153. Tooling Systems - Standards.** Studies the utilization of standard equipment, standard tooling and standard gaging methods adapted to the manufacturing process. Prerequisite: T.M.E. 152. Two lectures, two labs. (4S) **Child**

**158. Manufacturing Analysis.** Economics of tooling operations; the productivity of machines, tool maintenance, tool costs, and job estimating. Prerequisite: T.M.E. 148 (3F) **Preator**

**180. Motion and Time Study.** An analysis of motion and time study as a management tool. Studies job simplification and motion economy, time standards and performance ratings. (3F, W) **Child**

**181. Tool Design.** The study and design of production tools such as gages, jigs, and fixtures. Includes tool design standards, tolerances, springs, cam layout, and techniques of preparing tooling for production. Three lectures, two labs. Prerequisite: T.M.E. 153. (5W) **Somers**

**182. Die Design.** Emphasizes design and application of tooling to materials and products fabricated by press working production methods. Prerequisite: T.M.E. 181. Three lectures, two labs. (5S) **Preator**

**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. Prerequisite: T.M.E. 148. Two lectures, one lab. (3S) **Somers**

**184. Tool and Manufacturing Engineering Current Problems.** A review of current technical literature dealing with the latest production methods. Oral and written reports presented for discussion. (2F) **Staff**

**185, 186. Co-operative in Plant Training.** A co-operative training course conducted by the



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university and industry to supplement academic work with tool and manufacturing experiences. A satisfactory report from industry is required. Time and credit arranged.

Staff

187, 188. **Senior Project Laboratory.** Each student is required to work with a manufacturing problem involving design, development, construction, and testing. A formal technical report is required of each student. Prerequisite: Senior classification in Tool and Manufacturing Engineering. (2W, S) Staff

### Department of

## Industrial and Technical Education

(Industrial Arts Education, Trade and Industrial Education, Technical Education, Industrial Technology, Aeronautical Technology, Automotive Technology, Welding Technology)

PROFESSOR *William E. Mortimer*, HEAD; ASSOCIATE PROFESSORS *Charles N. Merkle*, *Owen Slaugh*, *Lowell P. Summers*; ASSISTANT PROFESSORS *Carl R. Bartel*, *Edward L. France*, *Charles W. Hailes*<sup>1</sup>, *Dan H. Swenson*, *Carl R. Wallis*, *Lynn R. Willey*; INSTRUCTORS *Leon M. Hill*, *Clyde Hurst*, *Antone B. Kemp*, *Samuel W. Merrill*; SUPERINTENDENT OF PLANT OPERATIONS AND LECTURER *Harold W. Wadsworth*.

### Office in Mechanic Arts 105

The Department of Industrial and Technical Education offers training programs in Aeronautical Technology, Automotive Technology, Industrial Arts Education, Trade and Industrial Education, Welding Technology. Beginning as a department of Mechanical Arts in 1888, it has developed and expanded its offerings to provide for the "liberal and practical education of the industrial classes" as outlined in the original charter for Land-Grant colleges and universities. USU has constantly strived to fulfill its obligation in this respect and to keep its training programs abreast of the times.

This department offers you two programs leading to the Bachelor of Science degree.

#### (I) *Programs for Industrial*

<sup>1</sup>On leave.

*Teacher Education.* These programs give professional training for teachers, supervisors, and administrators in Industrial Education positions. Courses are offered during the regular school year and Summer School. Your completion of the undergraduate curricula leads to the degree of Bachelor of Science in Industrial Education with a major in Industrial Arts Education for junior and senior high school positions, and Trade and Industrial Education for junior college, vocational, and technical school positions.

With the emphasis now being given to the training of technicians for industry, USU is giving additional emphasis to the training of teachers in this rapidly expanding field. There is great need for them in vocational schools, junior colleges, and in senior colleges which

have technician training programs of the technical institute type. The various teacher training curricula are described under the Industrial Education section.

(II) *Programs of University Grade for Industrial Technicians.* Present-day industry requires the services of scientists, engineers, technicians, and skilled craftsmen. These programs are planned for the higher level industrial technicians where a four-year program leading to a Bachelor's degree is essential to meet the demands of industry. The training provided combines technical knowledge and manual skills with a broad University education. The programs prepare you as a technician for technical, supervisory, or managerial positions in modern industry, and provide an excellent foundation for entrance into Civil Service industrial positions or for private business. Curricula in these programs are available with majors in Aeronautics, Automotive, and Welding Technology. They are described later under the sections carrying these headings.

### Technical Institute Type Training

*Industrial Technician Program.* A third kind of program of a non-degree nature is also offered by the department. This is usually a two-year program designed to prepare Industrial Technicians for modern industry. Completion of any one of the two-year curricula, leads to a certificate of completion. The industrial technician program offers many distinct advantages to students.

Upon completing this program you are well prepared with the technical skills and knowledge in the field of your choice and through your association and activities on

a university campus you are prepared to assume your role as a worthy citizen. Many industrial leaders of today have completed programs of this kind and have shown that the basic foundation they acquired through such programs gave them many opportunities for further progress and advancement. By returning to this institution for further training, as a qualified student you may apply most of the credit earned under this program toward a degree, and thus better prepare yourself for supervisory and managerial positions.

### Graduate Study

The Master of Science degree in Industrial Education is offered with majors in Industrial Arts Education or Trade and Industrial Education. Also, the Master of Industrial Education degree is offered. For information on the programs for these degrees see the Graduate School Catalog.

### Industrial Education

Curricula are offered for the professional training of teachers, supervisors, and administrative staff in Industrial Education. In addition, courses in woodwork, metalwork, drawing, leather, electricity and electronics, and plastics are offered. Upon completing your undergraduate courses you receive a Bachelor of Science degree in Industrial Education with a major in Industrial Arts Education, or Trade and Industrial Education.

### Industrial Arts Education

The curriculum in Industrial Arts Education is designed to meet state certification requirements for the General Secondary and Industrial Arts Certificates, and is composed of courses in arts, sciences,

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education, technical and professional industrial arts, and basic shop skills.

### Industrial Arts Education Curriculum

FRESHMAN				
Course	F	W	S	
English, 1, 2, 3 .....	3	3	3	
Math 34, <sup>1</sup> 35, 44 .....	3	5	3	
I.E. 1 .....		1	---	
F.A. Art 5 .....	3	---	---	
Lang. & Arts & Group .....	---	---	3	
I.E. 15, 16, 17 .....	3	3	3	
I.E. 61, 62, 63 .....	3	3	3	
M.S., A.S., or P.E. ....	1	1	1	

16 16 16

SOPHOMORE				
Course	F	W	S	
Exact Science Group .....	5	---	5	
Social Science Group .....	---	5	5	
Biological Science Group .....	5	5	---	
T.M.E. 56, Weld. 97, I.E. 50 .....	3	3	3	
I.E. 71, 72, 73 .....	3	3	3	
M.S., A.S., or P.E. ....	1	1	1	

17 17 17

JUNIOR				
Course	F	W	S	
I.E. 140, 141, 142 .....	3	3	3	
I.E. 149 .....	---	5	---	
Speech 21 .....	---	---	3	
Psy. 100 .....	3	---	---	
Psy. 102 .....	---	3	---	
Public Health 154 (or 155—4 cr.) ..	3	---	---	
Educ. 111, Educ. 114 .....	---	3	3	
I.E. 101 .....	---	1	---	
Depth Sequence .....	5	---	5	
Elective (minor) .....	3	3	3	

17 18 17

SENIOR				
Course	F	W	S	
I.E. 102 .....	---	3	---	
I.E. 107 .....	3	---	---	
I.E. 110 .....	---	3	---	
I.E. 112 .....	---	9	---	
I.E. 121 .....	---	3	---	
I.E. 129 .....	---	---	3	
Depth Sequence .....	5	---	5	
Elective (minor) .....	8	---	8	

16 18 16

<sup>1</sup>If you have completed high school Algebra B and make a satisfactory grade on the mathematics entrance examination, you may omit Math. 34 and begin with Math. 35 in the Fall quarter.

### Trade and Industrial Education

The trade and industrial program is designed primarily for instructors and supervisors in Vocational Technical Education and/or Vocational Industrial programs. As a candidate for the degree of Bachelor of Science in Industrial Education you must show evidence of successful trade and teaching experience, together with the general education requirements necessary for state certification in your field. Observation and directed teaching in the major and minor subjects may be substituted for teaching experience. The trade and teaching experience must be approved by a committee consisting of members of the Industrial Education staff.

### Trade and Industrial Education Curriculum

FRESHMAN				
Course	F	W	S	
Trade Training .....	5	5	5	
English 1, 2, 3 .....	3	3	3	
I.E. 6, Math. 341, 35 .....	3	3	5	
I.E. 15, 16, 17 .....	3	3	3	
I.E. 1, Art 1 .....	1	3	---	
M.S., A.S., or P.E. ....	1	1	1	

16 18 17

SOPHOMORE				
Course	F	W	S	
Trade Training .....	5	5	5	
Physics 17, 18, 19 .....	5	5	5	
Biological Science Group .....	---	5	5	
Sociology 70 .....	5	---	---	
Approved Electives .....	---	2	2	
M.S., A.S., or P.E. ....	1	1	1	

16 18 18

JUNIOR				
Course	F	W	S	
Adv. Trade or Tech. ....	5	5	3	
Lang. & Arts Group .....	3	---	---	
Speech 21 .....	---	---	3	
Econ. 51 .....	5	---	---	
Psy. 100, 102 .....	3	3	---	
I.E. 101, Ed. 113 .....	1	---	3	
I.E. 118, 120 .....	---	3	3	
Ed. 114 .....	---	3	---	
Public Health 154 (or 155—4 cr.) ..	---	3	---	
Electives .....	---	---	5	

17 17 17

## SENIOR

Course	F	W	S
Adv. Trade or Tech. ....	3	—	6
I.E. 107, 110 .....	3	3	—
I.E. 121, 129 .....	—	3	3
I.E. 112 .....	—	9	—
I.E. 102 .....	—	3	—
English 112 .....	—	—	3
Econ. 125 .....	3	—	—
Electives .....	7	—	4
	16	18	16

## Industrial 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**

**6. 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, S) **Mortimer**

**13. Driver Training.** 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. (OF, S, Su) **Willey**

**15. Technical Drawing.** Lettering, use of instruments, sketching, multiview drawings, reading and interpreting blueprints, and non-technical charts. One lecture, two labs. (3F, W) **Wallis**

**16. Technical Drawing.** Sections, auxiliaries, pictorials, developments, dimensions, screw threads, and threaded fasteners. Prerequisite: I.E. 15. One lecture, two labs. (3W, S) **Wallis**

**17. Technical Drawing.** Working drawings, limits and tolerances, sheet metal drafting, elements of architectural drawing, and reproduction of drawings. Prerequisite: I.E. 16. One lecture, two labs. (3F, S) **Wallis**

**30. Building Maintenance.** Discussion of materials used in maintaining modern school buildings and their proper use. Required of all persons doing part-time custodial work on campus. Two lectures; lab arranged. (3F, W S) **Wadsworth**

**50. General Metals.** Development of the skills of general metalworking. Experience in bench metal, sheetmetal, and foundry. A study of finishing, maintenance, shop safety and industrial practices of metal fabrication. Prerequisite: TME 56, Weld. 97. (3S) **Merkley**

**61. Technical Woods.** Study and practice in the use and care of hand tools, including the sharpening of tools, and a study of the fundamental hand tool processes. An introduction to the use of common woodworking machines. One lecture, two labs. (3F) **Swenson**

**62. Technical Woods.** A study of safety measures, use and care of all the common woodworking machines, including the sharpening of machine cutters and other machine maintenance problems. A study of woods and various other materials related to wood construction. Prerequisite: I.E. 61. One lecture, two labs. (3W) **Swenson**

**63. Technical Woods.** The design and construction of furniture and other advanced projects. Provides additional experience and practice in both hand tool and machine processes for students who have completed I.E. 62. Prerequisite: I.E. 62. One lecture, two labs. (3S) **Swenson**

**68. Practical Electric Wiring.** Covers the national electrical code and local codes in Utah communities. Includes choice of materials, design of circuits and inspection for electrical heat, light and power installation in homes and small public buildings. Two lectures, one lab. (3W) **Swenson**

**71. Technical Electricity-Electronics.** A study of the fundamentals of electricity and the various sources of electrical energy. Ohms law principles governing the behavior of direct current circuits are thoroughly covered. Practical applications of direct current circuits are included. (3F) **Staff**

**72. Technical Electricity-Electronics.** A study of the fundamentals of alternating current theory including inductance, capacitance and reactance. Sources of alternating current energy are covered together with practical applications of alternating current circuits. Prerequisite: I.E. 71. (3W) **Staff**

**73. Technical Electricity-Electronics.** An introduction to radio communication principles including antenna systems, tuning systems, detectors, amplifiers, power supplies and control circuits. A superheterodyne receiver is built and miscellaneous applications of electronics are covered. Prerequisite: I.E. 72. (3S) **Staff**

**74. 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 woodwork 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. Emphasis is

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given to wood turning. Instruction is also given in furniture repair and in the basic principles of wood finishing and re-finishing. (2 to 5F, W, S) **Staff**

**101. Observations in Student Teaching.** Serves as a preliminary to the regular student teaching in Industrial Education. You are assigned to various schools within the area to observe teaching in Industrial Arts or Trade and Industrial Education. (1F, W, S),

**Mortimer, Hailes**

**102. Instructional Aids.** Instruction in the purpose, types, sources, preparation and proper use of audio and visual aids, including samples, models, charts, graphs, slides, still film, movie film, sound film and other aids suitable for classroom and auditorium use. Prerequisites: I.E. 107. (3W)

**104. Occupational Analysis.** Principles and practice in analyzing occupations. You complete an analysis of one unit for a trade or occupation. (3F, W, Su)

**Bartel**

**107. 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. (3F) **Hailes, Mortimer**

**110. Shop Organization and Management.** Teaches you to organize and manage an Industrial Education Shop of the unit, general, or multiple activity type. You 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. Prerequisite: I.E. 107. (3W, Su)

**Bartel, Hailes**

**111. The 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. Prerequisite: I.E. 107. (3F, W, S, Su)

**Mortimer, Hailes**

**112. Student Teaching in Industrial Education.** You observe and teach in Industrial Arts shops throughout the state. Under close supervision, you do practice teaching in various Industrial Arts courses recommended by the state in junior and senior high schools. (9W)

**Mortimer, Hailes**

**113. Driver Education and Traffic Safety.** To acquaint prospective teachers and others with available instructional materials for driver education and the latest methods of presenting

these materials in the classroom and on the road. Supervised practice is arranged for you. Credit arranged. (F, S, Su)

**Wiley**

**114. Problems in Driver and Safety Education.** For teachers, school administrators, and others responsible for directing or supervising safe living programs in the school or community. The course includes traffic and liability law, insurance, stimulants and depressants, public relations, safety research, and applied psychology. (4W, Su)

**Staff**

**\*\*115. Industrial Drafting.** Fundamentals and conventional drafting practices in architectural, sheet metal, electrical, machine, pictorials and technical illustration. Prerequisite: I.E. 17. (5F)

**Wallis**

**\*\*116. Industrial Drafting.** Techniques in basic drawing, sketching, reproductions, visual aids, chalkboard, evaluation, tests, and designs for secondary school teachers. Prerequisite: I.E. 115. (5S)

**Wallis**

**118. 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, administration, and coordination of safety education programs. (3F, W, S, Su)

**Bartel**

**120. 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, S)

**Hailes**

**121. Methods in Industrial Education.** Latest techniques of teaching applied to individual and group instruction in Industrial Education. You have opportunity to use these different methods in presenting lessons before the class. Prerequisite: I.E. 107. (3W)

**Mortimer**

**129. Organization and Development of Instruction Materials.** Selection and arrangement of teaching materials to be used in industrial arts and trade and industrial shop work. (3S)

**Bartel, Mortimer**

**140. Industrial Crafts—Leather.** The history and manufacturing processes of leather and leather articles. Study of different leathers and their application in craft work. Instruction in fundamental operation and in surface decoration of leather including modeling, stamping, and carving. Basic design principles as applied to leathercraft will be emphasized.

**\*\*Taught 1962-63.**

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phasized. Prerequisite: Completion of lower division I.E. sequence courses.  
(3W, S) **Wallis**

**141. 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. Prerequisite: Completion of lower division I.E. sequence courses. (3S) **Merkley**

**142. Industrial Crafts—Plastics.** Acquaints you with the new and important group of plastic materials now produced and the fundamental operations used in working these materials. Emphasis is given to the place of plastics in modern industrial arts programs. Prerequisite: Completion of lower division I.E. sequence courses. One lecture, two labs. (3F, S, Su) **Hailes**

**144. 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) **Merkley, Hailes**

**149. Power Mechanics.** A study of the operation and maintenance of internal combustion engines such as the automobile, diesel, scooter, and lawn mower. Emphasis placed on factors and procedures involved in setting up and conducting a power unit in an industrial arts laboratory. (Not open to Auto. Tech. majors.) (5W) **Staff**

**150. 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 quarter hours credit, to be acquired at a rate not to exceed one and a half quarter hour credits per 40 clock-hour week. You 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. Time and credit arranged. **Staff**

**\*154. Industrial Metals.** Machine shop practice and metalwork. Precision measuring and layout in metalwork. The study and operation of the engine lathe, shaper, milling machine, grinder, and power hacksaw. Prerequisite: I.E. 50. (5F) **Staff**

**\*155. Industrial Metals.** This course fills the needs of advanced shop theory and technical

information about tools, materials, and operations that are common to the metal occupations. This includes machine shop, foundry work, sheet metal, ornamental metals, and industrial manufacturing. Methods of teaching metalwork and the development, construction, and uses of metal projects designed for high school teaching purposes will be stressed. Prerequisite: I.E. 154. (5S) **Staff**

**\*161. Industrial Wood.** This is a course in advanced cabinet and furniture making and includes work in upholstery. Construction design is studied and opportunity for application of original designs is provided. Additional work in cabinet and furniture finishing is included. Prerequisite: I.E. 63. (5F) **Swenson**

**\*162. Industrial Wood.** 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 high school shops is included. Mass production techniques are discussed and put into practice. Prerequisite: I.E. 161. (5S) **Swenson**

**167. 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, S, Su) **Staff**

**\*\*171. Industrial Electricity-Electronics.** This course deals with electronics in industry and covers electron tube analysis and applications together with an introduction to semi-conductors and transistor applications. Frequency modulation and television fundamentals are also covered. Prerequisite: I.E. 73. (5F) **Staff**

**\*\*172. Industrial Electricity-Electronics.** This course is devoted to project planning and methods of instructing electronics for students preparing to teach in the secondary schools. Opportunity is provided for original ideas to be worked out on an experimental basis. Prerequisite: I.E. 171. (5S) **Staff**

**180. 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, Su) **Staff**

\*Taught 1961-62.

\*\*Taught 1962-63.



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**181. 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**

**182. 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) **Hailes, Mortimer**

**185. 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 hours credit. Credit arranged. (F, W, S, 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, S, Su) **Staff**

**207. Philosophy of Vocational Education and the Practical Arts.** Designed to enrich and expand your 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. Prerequisite: I.E. 107 or equivalent. (3F, W, S, 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: I.E. 104. Three lectures. (3F, W, S, Su) **Bartel, Mortimer**

**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. (3F, W, Su) **Mortimer**

**251. Administration and Supervision of Industrial Education.** The laws, regulations, and policies affecting Industrial Education programs; organization, supervision, and management necessary for successful operation of these programs. (3F, W, S, Su) **Bartel, Mortimer**

**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. (3W, S, 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. (3F, W, S, Su) **Staff**

**267. Reading and Conference.** Provides for study in advanced and specialized problems in Industrial Education. Problems are selected with approval of department head; investigation is carried on under direction of the major professor. Credit arranged. (F, W, S, Su) **Bartel, Mortimer**

**270. Seminar in Industrial Education.** Gives opportunity for investigation and reporting of individual problems. (1 to 2F, W, S, Su) **Bartel, Mortimer**

**271. Research and Thesis Writing.** Provides for individual work in thesis writing in industrial education. Credit arranged. (F, W, S, Su) **Bartel, Mortimer**

### *Programs in*

## Technical Education

*Two-year Programs.* Any one of the two-year technical education programs prepares you for immediate employment in any of the technical service occupations appropriate to the training received. New and expanding industries have created many new job opportunities for technically trained men. The two-year program provides a broad educational experience for you who do not plan to obtain a Bachelor's Degree, yet it fulfills some of the requirements for the degree where you decide later to continue your studies.

The completion of any program entitles you to a Certificate of Completion. In Aeronautics the Certificate would be in Airframe and Powerplant Mechanics and is based upon the satisfactory completion of the Federal Aviation Agency written and practical examination in Airframe and Powerplant Mechanics.

At present the University offers technician training programs in Aeronautics, Automotive, Welding, and Drafting. The programs of training are built around a core curriculum which provides for areas of specialization in the fields just mentioned. You select your particular area of specialization and then register for the course outlined below.

## Core Curriculum

### FIRST YEAR

Course	F	W	S
English 1, 2, 3.....	3	3	3
I.E. 6.....	3	....	....
Math. 34.....	....	3	....
I.E. 15, 16, 17.....	3	3	3
TME 56.....	....	....	3
I.E. (Orientation) .....	1	....	....
Specialization (See lists that follow) .....	5-8	5-8	5-8
P.E. ....	1	1	1
	16	15	15
	19	18	18

### SECOND YEAR

Course	F	W	S
Phyx. 31, Chem 31, Geol. 31 (or Phyx. 6 & Chem. 10).....	3	3	4
Econ. 51.....	5	....	....
I.E. 118, 120 .....	....	3	3
I.E. 71, Weld. 97.....	3	3	....
C.E. 2 .....	1	....	....
Humanities .....	....	....	2
Specialization (See lists that follow) .....	5-8	5-8	5-8
P.E. ....	1	1	1
	18-	15-	16-
	21	18	19

### SPECIALIZATION

Aeronautics	F	W	S
First Year 5, 5a; 6, 6a; 7, 7a.....	8	8	8
Second Year 8, 8a; 9, 9a; 10, 10a	8	8	8

### Automotive

First Year 1, 2, 3 .....	5	5	5
Second Year 4, 5, 6 .....	5	5	5

### Auto Body Reconditioning

First Year 1, 52, 3 .....	5	3	5
53 .....	....	3	....
Second Year 12, 13, 162 .....	5	5	3
62 .....	....	3	....

### Diesel Curriculum

First Year Auto 21, 22, 23 .....	5	5	5
Second Year Auto 4, 5, 122 .....	5	5	3

### Drafting

First Year Math. 35, 46 .....	....	5	5
LAEP 20 .....	....	3	....
Electives .....	....	2	3
Second Year C.E. 84, 82 .....	....	4	4
M.E. 21, 22 .....	....	3	3
M.E. 105 .....	....	3	3
I.E. 50 .....	....	....	3
I.E. 68 .....	....	....	3

### Welding

First Year 41, 42, 43 .....	5	5	5
Second Year 44, 45, 46 .....	5	5	5

## Programs in

## Industrial Technology

*Four-year Degree Programs.* Students registering in the Industrial Technology program with majors in Automotive Technology or Welding Technology, will register in the general curriculum which follows. The courses constituting the Aeronautical major are listed in the Aeronautics section; those constituting the major in Automotive are listed in the Automotive section; those constituting the Welding major are listed in the Welding section.

## Industrial Technology Degree Curriculum

### FRESHMAN

Course	F	W	S
Major Area .....	5	5	5
English 1, 2, 3 .....	3	3	3
Math. 34, 35, 44 .....	3	5	3
I.E. 1 (Orientation).....	....	1	....
I.E. 15, 16, 17.....	3	3	3
M.S., A.S., or P.E. <sup>1</sup> .....	1	1	1
Approved Electives.....	2	....	2
	17	18	17

<sup>1</sup>See footnote page 154.

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### SOPHOMORE

Course	F	W	S
Major Area .....	5	5	5
Chem. 10, 11 .....	5	5	...
I.E. 71, TME 56 .....	3	3	...
Biology 1 .....	...	...	5
C.E. 2 .....	1	...	...
Speech 105, Lang. & Arts. Elect. ....	3	3	...
M.S., A.S., or P.E. <sup>1</sup> .....	1	1	1
Approved Electives .....	...	...	5
	18	17	16

### JUNIOR

Course	F	W	S
Major Area .....	3	3	3
Phyx. 17, 18, 19 .....	5	5	5
Econ. 51, Soc. 70 .....	5	5	...
Physiology 4 .....	...	...	5
I.E. 118, 120 .....	...	3	3
Upper Div. Electives .....	3	2	3
	16	18	19

### SENIOR

Course	F	W	S
Major Area .....	3	3	3
Econ. 125 .....	3	...	...
English 112 .....	3	...	...
M.E. 110 .....	...	4	...
B.A. 100, 147, 148 .....	3	3	3
T.E. 150 .....	4	...	...
Upper Division Electives .....	...	7	10
	16	17	16

Approved upper division electives are as follows: Econ. 106, 126, 127, 170, 180; Bus. Admin. 170, 171, 172, 174; Soc. 158; I.E. 102, 104, 144, 148; M.E. 174; Speech 109; Pol. Sci. 117, 118, 119; Psy. 155; C.E. 130; T.E. 148, 180; Pub. Health 150; Chem. 121; Eng. 147.

## Aeronautical Technology

This program offers instruction for thorough training of skilled airframe and powerplant mechanics and aeronautical technicians.

USU's Aeronautical Technology is fully certified with Air Agency, complying with Federal Aviation Agency regulations, and holds Certificate No. 1175 covering training of combined airframe and powerplant mechanics. Satisfactory completion of the two-year curriculum qualifies you to apply for FAA airframe and powerplant mechanic

ratings. As a graduate in the four-year curriculum you are required to have successfully accomplished the written and practical FAA examinations for these ratings. This training prepares you for both airframe and powerplant maintenance, and manufacturing employment. The degree curriculum combines a thorough technical training in aeronautics with a general university education. Training is based upon the objective of scientifically and systematically developing you to a point where you can assume responsible positions in the industry.

Facilities include complete laboratories and modern equipment for instruction in powerplants, propellers and accessories, aircraft construction, and maintenance and repair, including hydraulic systems and instruments.

## Aeronautical Technology Curriculum

Course	FRESHMAN	F	W	S
Aero. 5, 6, 7 .....	4	4	4	4
Aero 5a, 6a, 7a .....	4	4	4	4
Math. 34, 35, 46 .....	3	5	5	5
English 1, 2, 3 .....	3	3	3	3
T.E. 56 .....	3	.....	.....	.....
Weld. 92 .....	.....	3	.....	.....
I.E. 71 .....	.....	.....	.....	3
M.S., A.S., or P.E. <sup>1</sup> .....	1	1	1	1

Total ..... 18 20 20

Course	SOPHOMORE	F	W	S
Aero. 8, 9, 10 .....	4	4	4	4
Aero. 8a, 9a, 10a .....	4	4	4	4
I.E. 15, 16, 17 .....	3	3	3	3
C.E. 2 .....	1	....	....	....
Physics 17, 18, 19 .....	5	5	5	5
A.S., M.S., or P.E. <sup>1</sup> .....	1	1	1	1

Total ..... 18 17 17

Course	JUNIOR	F	W	S
Chem. 10, 11 .....	5	5	...	
English 112 .....	...	...	3	
Aero. 100, 105, 134 .....	3	2	4	
Aero. 101, 102, 126 .....	4	3	3	
Econ. 125 .....	3	...	...	
I.E. 120 .....	3	...	...	
Approved Electives <sup>2</sup> .....	...	6	6	

Total ..... 18 16 16

<sup>1</sup>Two credits are given for M.S. or A.S.

<sup>2</sup>See footnote page 155.

# SENIOR

Course	F	W	S
Aero. 103, 104, 132 .....	3	3	3
T.E. 150 .....	.....	.....	4
M.E. 110 .....	4	.....	.....
TME 148 .....	3	.....	.....
TME 180, Aero 130 .....	3	2	.....
M.E. 19 .....	.....	.....	3
Speech 105 .....	.....	3	.....
Approved Electives <sup>2</sup> .....	4	9	8
Total .....	17	17	18

## Aeronautical Technology Courses

5, 5a. Composite Aircraft Structure. Design, construction, repair, and maintenance of composite aircraft, including wood structures, fabric work and finishing, control systems, landing gear, engine mounts, and pertinent Civil Air Regulations. Five lectures, five labs. (4 and 4F) **Merrill**

6, 6a. All-metal Aircraft Structure. Design, construction, repair, and maintenance of all-metal aircraft, including layout, template and flat plate development, bend allowance, hand forming, riveting procedure, special tool construction, power press and power shear operation, heat treatment, corrosion prevention, and pertinent Civil Air Regulations. Five lectures, five labs. (4 and 4W) **Merrill**

7, 7a. Aircraft Maintenance. The maintenance, repair, and alteration of modern aircraft and miscellaneous related equipment, including aircraft hydraulics, electrical equipment and installation, and general servicing of components; rigging, weight and balance computations, periodic inspections, recording of repairs and alterations, time and material cost estimates, material and equipment requirements. Pertinent Civil Air Regulations are studied. Five lectures, five labs. (4 and 4S) **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**

tion 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 systems, 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 4S) **Hill**

31. Civil Air Regulations, Radio and Airway Procedures. Rules and regulations pertaining to operation of aircraft, radio, and airway procedures. Open to all students. (2F, W, S) **Staff**

34. Navigation. Maps, charts, and navigational problems. Required by the CAA for all pilot rating. Open to all students. (3F) **Merrill**

37. Private Pilot Certificate. Flight School Primary. Flight training to meet FAA requirements. Satisfactory completion of FAA tests required for certification. Credit arranged; limit three credits. (F, W, S) **Staff**

100. Fundamentals of Turbo-Jet Propulsion. History, development and general principles of jet propulsion. Thrust and performance, combustion systems, metallurgy, fuels, fuel controls, lubrication and ignition systems, aerodynamic problems, applications. Prerequisite: Aero. 10. (3F) **Summers**

101. 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**

102. Advanced Turbo-Jet Propulsion and Gas Turbines. Extension of fundamental theory, axial and centrifugal flow compressors, gas turbines, jet propulsion, turbo-prop engines. Prerequisite: Aero. 100. Two lectures, one lab. (3W) **Summers**

<sup>2</sup>Electives must be approved by department head. May include advanced military or air science.

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**103. Elementary Aircraft Design.** Basic constructional concepts relating to aircraft design. (3F) **Summers**

**104. 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: Aero. 103. (3W) **Summers**

**105. Aircraft Woods and Plastics.** Analysis of materials as applied to aircraft. Emphasis on investigation and development of methods involving design criteria. (2W) **Staff**

**126. Airline Maintenance and Fixed Base Operations.** Administrative problems or airline and airport management; unit organization; personnel problems; relationships with Civil Aeronautics Adm.; interline agreements, promotion and publicity. (3S) **Staff**

**130. Aeronautics Seminar.** Current topics in production methods, cost, design, supply and organization of interest to aeronautical technicians. (2F, W, S) **Staff**

**132. 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. (3S) **Staff**

**134. Aircraft Electrical Systems and Equipment.** The more complex electrical systems used in larger aircraft. Prerequisite: I.E. 71, Aero. 10. Three lectures, one lab. (4S) **Summers**

**137. Commercial Pilot Certificate.** Flight training to meet FAA requirements. Satisfactory completion of FAA tests required for certification. Prerequisites: Private Pilot Certificate and Aero. 34. Credit arranged; limit 10 credits. (F, W, S) **Staff**

### Automotive Technology

The major in Automotive Technology consists of the following courses: Auto. 1, 2, 3, 4, 5, 6, 101, 102, 162, 103, 151, 152, I.E. 113.

The major in Diesel Technology consists of the following courses: Auto. 21, 22, 23, 4, 5, 6, 101, 122, 162, 103, 151, 152, I.E. 113.

The following courses are also required in Auto & Diesel: Welding 91 and 94 in the Freshman year, Chem. 12, and Welding 190 or 191.

Training programs leading to a Bachelor of Science degree are offered in both Automotive and Diesel Technology. Two-year terminal programs are offered in these same areas and also in Auto Body Reconditioning. In addition, general service courses are provided for students in other departments or programs who desire to become familiar with various phases of automobile work. Courses are also conducted in Driver Education Teacher Training.

Facilities include a new building designed and built specifically for automotive and aircraft instruction. The laboratories contain the most modern servicing and testing equipment, and provide ideal conditions for study.

The course of study in Automotive or Diesel Technology prepares you to be a technician well trained to interpret the designs of engineers and direct the work of skilled craftsmen. This major also prepares you to become a shop foreman, shop superintendent, or with special preparation, a school instructor. Excellent background is provided for entrance into civil service, private business, and managerial positions with large companies.

*Service Courses*, open to any student, are: Auto 51, 52, 53, 55, 61, 62 and 162.

### Automotive Technology Courses

Note: All courses include technical lectures and related shop experience. Theory, construction, operational characteristics, and recommended repair procedures are emphasized.

**1. Steering Correction.** Brakes, steering mechanisms, suspension systems, frames, balance, and alignment. (5F, W) **Willey**

**2. Automotive Engines.** Covers modern automobile engines, including cooling and lubrication. (5F, W) **Willey**

**3. Driving Mechanisms.** Clutches, transmissions, U-joints, drive lines, and rear axle assemblies. (5S) **Hurst**

**4. Fuel Systems.** Fuel tanks, carburetors, fuel pumps, fuel lines and manifolds. Includes discussions on superchargers, governors, and fuel injection. (5F, W) **Slaugh**

**5. Auto Electrics.** Ignition, batteries, generating systems, and cranking motors. (5F, W) **Slaugh**

**6. Motor Tune-up.** Trouble diagnosis and testing procedures. Covers horns, lighting systems, and other electrical units along with engines and carburetion units. Prerequisites: Auto 2, 4, 5. (5S) **Slaugh**

**12. Fender Reconditioning.** Modern processes of straightening and priming fenders. (5F) **Willey**

**13. Body Reconditioning.** Complete body rebuilding procedures. Prerequisite: Auto 12. (5W) **Willey**

**21. Heavy Duty Chassis.** Steering devices, suspension systems, brakes, frames, and alignment factors on trucks and tractors. (5S) **Hurst**

**22. Automotive Diesel Engines.** Four-stroke cycle and two-stroke cycle Diesel engines used in trucks and tractors. (5W) **Hurst**

**23. Heavy-duty Drives.** Power transmission units used on trucks and tractors. (5F) **Hurst**

**51. Automobile Chassis.** A general course on brakes and steering units. Open to any student who wishes to learn minor service procedures. (3F) **Hurst**

**52. 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. (3S) **Willey**

**53. Automobile and Farm Engine Electricity.** Stresses service and repair procedures within the reach of the average driver. Covers battery and magneto ignition and includes the major electrical systems. (3S) **Slaugh**

**55. 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 car purchasing judgment. (3W) **Slaugh**

**61. 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**

**62. Upholstering.** Modern automobile and furniture upholstery processes. Upholster your own units as you learn. (3W) **Willey**

**101. Frame, Suspension, and Steering Systems.** An advanced course in steering geometry and steering problems. Power brakes and power steering devices are included. Prerequisites: Auto 1, Math. 34, 44. (3F) **Hurst**

**102. 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: Auto 2, Math 44. (3W) **Slaugh**

**103. Automatic Transmissions.** Includes modern automatic transmissions and torque converters, electric clutches, and hydraulic systems. Prerequisite: Auto 3. (3W, S) **Hurst**

**122. Fuel Injection Systems.** Various types of Diesel and gasoline injection systems are included. Modern testing equipment is used. Prerequisite: Auto 22. (3W) **Hurst**

**151. Carburetion.** Combustion processes, heat cycles, and fuel characteristics are studied in connection with internal combustion engine carburetion problems. Prerequisites: Auto. 4, Math. 35. (3F) **Slaugh**

**152. Motors, Generators, and Magnetos.** An advanced course covering technical phases of these units. Laws of Physics are applied. Prerequisites: Auto 5 and preferably Physics 19. (3W) **Slaugh**

**162. 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. (3F) **Willey**

## Welding Technology

The major in Welding Technology consists of the following courses: Welding 41, 42, 43, 44, 45, 46, 153, 154, 161, 162, 163. T.E. 57 and 148 are also required in this major.

This program provides instruction in all phases of electric and



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oxy-acetylene welding, with a curriculum leading to a Bachelor of Science degree. In addition, general service courses are offered for students in other departments who desire to become familiar with basic welding as it applies to their fields of endeavor.

### Welding Technology Courses

In each of the following courses, Welding techniques in various positions are practiced. American Welding Society (A.W.S.) tests are made on samples welded in different positions. Safety precautions and proper use of equipment are emphasized.

**41, 42, 43. Acetylene Welding.** Principles and practices in all phases of oxy-acetylene welding, heating, and cutting operations. Designed primarily for those who desire to obtain the necessary knowledge and skill for welding in industry. (5F, 5W, 5S) **France**

**44, 45, 46. Electric Arc Welding.** Principles and practices in all phases of Electric Arc Welding. Gives you an opportunity to reach a high degree of efficiency in the welding of mild steel. Attention is given to hard surfacing, semi-automatic, and submerged arc welding. (5F, 5W, 5S) **Kemp**

**91. Acetylene Welding.** Principles and practice in fundamentals of oxy-acetylene welding and cutting. A general service course open to all university students. Two lectures, two two-hour labs. (3F, W, S) **France**

**92. Aero Welding.** A basic course providing an introduction to the fundamental principles of oxy-acetylene welding and cutting as it applies to aircraft production and repair as set forth by Civil Air Regulations. Sufficient laboratory practice is provided to prepare you for CAA Tests in aircraft welding. Two lectures, two two-hour labs. (3W) **France**

**94. 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, S) **Kemp**

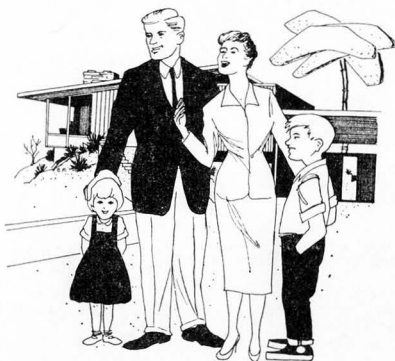
**97. Fundamentals of Welding.** A basic service course designed to acquaint you with the more common welding processes for metals joining. Units include fusion welding of mild steel sheet and plate with the oxy-acetylene and arc processes, brazing of ferrous and non-ferrous metals, silver soldering and oxy-acetylene cutting. Two lectures, two two-hour labs. (3F, S) **France**

**153, 154. Advanced Acetylene Welding.** A detailed survey and analysis of the oxy-acetylene welding processes and procedures, together with sufficient laboratory practice to qualify you for welding code tests. Special cutting problems, inspection and management, and welding metallurgy. Prerequisite: Weld. 43. (3F, 3W) **France**

**161, 162, 163. Advanced Electric Welding.** Designed for welding majors. Consideration is given to inspection, weldability of metals, welding metallurgy, design and cost estimating. Laboratory practice includes inert gas welding, manual arc welding, submerged arc welding, and resistance welding. Prerequisite: Welding 44 or 94. (3F, 3W, 3S) **Kemp**

**190. Advanced Acetylene Welding.** Designed to meet the need of those desiring more information and practice in welding than is given in Welding 91. Prerequisite: Welding 91. (3S) **France**

**191. Advanced Electric Arc Welding.** A continuation of Welding 94. Teaches methods of vertical and overhead welding and special problems such as hard surfacing and the welding of cast iron. Special problems in research are included. Prerequisite: Welding 94. (3F, W, S) **Kemp**



## *College of Family Life*

College of

## Family Life

*Department of Clothing and Textiles, 162*

*Department of Family Living and Child Development, 164*

*Department of Food and Nutrition, 167*

*Department of Homemaking Education, 169*

*Department of Household Administration, 171*

*Combination Major in Family Life and  
Secretarial or Clerical Practice, 173*

### Degrees Offered:

Bachelor of Science  
Master of Science

*College of*

# Family Life

Phyllis Snow, Dean

## Office in Family Life 102-B

The College of Family Life provides a well rounded educational program, emphasizing human relationships as well as theory and skills. The major purpose of the College is twofold: First, to help you prepare for more effective living in the home and the community; second, to help you prepare for a professional career in an area of your choice.

Professional opportunities open to you as a graduate in the College of Family Life include teaching, extension service, institutional management, research in Family Life, and working with children in nursery schools, day-care centers, and in hospitals.

The departments in this college are: Clothing and Textiles; Family Living and Child Development; Food and Nutrition; Household Administration; and Homemaking Education.

A Bachelor of Science degree and a Master of Science degree are offered in each of these programs. Courses may be arranged so that you can obtain your M.S. degree work in Summer School, providing that your research project is done on the job during the winter months.

The curriculum for the College of Family Life is based on the various departmental major and minor requirements together with the University group requirements.

The following Family Life courses are available for students in each department of the College:

- F.L. 190. Independent Study.** For qualified students upon consultation with the instructor. Credit arranged (F, W, S, Su) **Staff**  
**F.L. 290. Independent Study.** For qualified students upon consultation with instructor. Credit arranged. (F, W, S, Su) **Staff**  
**F.L. 295. Research for Master's Thesis.** Credit arranged. (F, W, S, Su) **Staff**

Since preparation for marriage and family living is a real concern for students anticipating marriage, or recently married, the following general education courses in marriage and family life are provided for men and women in all colleges and departments of the University. You may select those courses most appropriate to your personal needs and interests.

- FL-CD 20 Preparation for Marriage and Family Living**  
**FL-CD 67 Early Childhood**  
**BE 85 Personal Finance and Consumer Problems**  
**FN 5 Principles of Nutrition**  
**FN 9 Nutrition and Food Management**  
**CT 8 Basic Clothing Construction**  
**CT 15 Clothing Selection (For Men)**  
**HA 149 Home Management**

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### Department of

# Clothing and Textiles

ASSOCIATE PROFESSOR *Theta Johnson*; ASSISTANT PROFESSOR *Haruko Terasawa*; INSTRUCTOR *Norma W. Pierson*.

### Office in Family Life 204

The curriculum for a major in Clothing and Textiles includes the following courses CT 5, or 8, 24, 25, 105, 112, 125, 165, 170, 175, 185, and 191; an additional 18 credits in Visual Arts including 1, 5, 40, 115, and 135.

If you desire a minor in Clothing and Textiles, you should include CT 5 or its equivalent, 8, 24, 25, plus eight hours credit selected from other courses included in the CT major.

*Fashion Merchandising.* If you are preparing for Fashion Merchandising, you may wish to complete a major in CT and a minor in Business Administration, or a major in Business Administration with a minor in CT. The curriculum in Business Administration should include BA 151, 152, 161, 162, and 163.

*Textile Research.* If you are preparing for Textile Research, you should complete a double major in CT and chemistry.

*Home Projects.* A home project conducted during the summer between sophomore and junior years is required of all majors in Home Economics Education and CT. Clothing 25 is a prerequisite. Within the first two weeks of the fall quarter the project is turned into the department to be scored. The purpose is to develop speed and skill in techniques of construction and fitting through more experience than can be given in class time.

### Graduate Study

*Master of Science.* The Clothing and Textile Department offers study and research to qualify you for a Master of Science degree.

### Clothing and Textile Courses

**5. Art in Everyday Living.** Study of the principles of design and color as related to the individual, the home, and family living. Recommended for all students in the College of Family Life. (3F, W, S) **Terasawa**

**8. Basic Clothing Construction.** Application of the principles of clothing construction and selection to the use of commercial patterns and their adaptation, with emphasis on the organization of procedure, basic speed techniques, and fitting as related to individual needs. Class may be exempted upon departmental approval of previous work, or successful completion of a pre-test. Prerequisite: CT 5. (3F, W, S) **Pierson**

**15. Clothing Selection for Men.** Men's apparel as related to the wearer. Consideration is given fundamentals of fabric and garment selection. Organized to meet the needs of men in all colleges of the University. (2W) **Staff**

**24. Textiles.** A study of fibers, yarns, fabric construction and finishes as related to selection, use, and care. (3F, W, S) **Staff**

**25. Intermediate Clothing Construction.** Further application of the principles of clothing construction with emphasis on the fitting and alteration of commercial patterns, and the fitting of clothing to variously proportioned figures. Consideration is given to the development of greater dexterity in the use of equipment. Prerequisites: CT 8 or equivalent, and CT 5. (3W, S) **Staff**

**33. Home Furnishings.** To help develop an appreciation of home furnishings; their construction, selection, use and care. Consideration is given to the materials and processes involved. Recommended HA 65, CT 5 or its equivalent. (3F, W, S) **Terasawa**

## *Clothing and Textiles 163*

**105. History of Costume.** A study of costume for men and women from ancient times to the present in relationship to the social, economic, and political influences of the times and their importance in the evolution and inspiration of modern dress. (3F) **Terasawa**

**112. Costume Design.** A practical application of the principles of design to clothing design and illustration. Emphasis is placed on originality and judgment in quality of design and color. Prerequisite: CT 5. Recommended Visual Arts 5, 135. (2W, S) **Terasawa**

**125. Draping.** Creative experience in dress designing by draping on the dress form. Emphasis placed on fitting and understanding the effect of pattern, grain, and textures on design and dress. Problems consist of making a French lining and draping two garments. Prerequisite: CT 25. Recommended, CT 170. (3W, S) **Terasawa**

**141. Weaving.** Fundamental principles of weaving. Emphasis on weaving for practical use—place mats and napkins, aprons, skirts, or blouse materials. (3F, W) **Terasawa**

**165. Tailoring.** Application of techniques used in tailoring suits and coats. Prerequisite: CT 25. Recommended, CT 125. (3F, W) **Staff**

**170. Flat Pattern Designing.** Application of the principles of dress design to the construction of patterns by flat pattern method. Emphasis on the development and use of a basic sloper; and the interpretation of a design in relation to the principles of clothing construction. Prerequisite: CT 25. (3W, S) **Terasawa**

**\*175. Advanced Textile Problems.** Emphasizes recent textile advances and research techniques. Consideration is given to physical and chemical testing and use of the microscope. Prerequisite: CT 24. Recommended, Chem. 10, 11, 12. Outside work required. (3S) **Staff**

**185. Family Clothing.** A study of the factors which influence clothing as it is related to family needs: the economic, sociological, and psychological influences, and the care and renovation of clothing for the family. Prerequisite: CT 8 or equivalent. (3W) **Terasawa**

**190. Independent Study.** See Family Life 190. Credit arranged. (F, W, S, Su) **Staff**

**191. Seminar.** Reports and discussions on newer developments in the field of clothing and textiles. (2F, S, Su) **Staff**

**204. Clothing Economics.** A study of the factors which influence economics of clothing; analysis of the fashion industry; economics of manufacture and marketing clothing. (3F, W, S) **Staff**

**290. Independent Study.** See Family Life 290. Credit arranged. (F, W, S, Su) **Staff**

**291. Graduate Seminar.** Open to graduate students in CT. Credit arranged. (3S, Su) **Staff**

**295. Research for Master's Thesis.** Credit arranged. (F, W, S, Su) **Staff**

\*Taught 1961-62.



## 164 College of Family Life

### Department of

# Family Living and Child Development

PROFESSORS *Don C. Carter*, HEAD, *Dorothy T. Dyer*; ASSOCIATE PROFESSORS *Dorothy B. Lewis*, *C. Jay Skidmore*; ASSISTANT PROFESSOR *Ruby Eames*; INSTRUCTOR *Louise Godfrey*; HEAD TEACHER IN CHILD DEVELOPMENT LABORATORY AND COOPERATIVE NURSERY *Valera G. Holman*.

### Office in Family Life 118

The Department of Family Living and Child Development offers work leading to the *Bachelor of Science* and *Master of Science degrees*.

Two separate majors are available for either graduate or undergraduate study. You may select the one in which you are most interested. The majors are (1) Child Development, (2) Marriage and Family Living. Either major represents a desirable area of study if you are interested in children or family life, either professionally or as a prospective parent.

*The major in Child Development* should prepare you for a more satisfying role as a parent and, professionally, for: teaching in and conducting a nursery school; teaching in kindergarten or elementary school; extension service positions in child development and parent education; play director in a children's hospital; study toward an advanced degree.

*The major in Marriage and Family Living* should contribute to your happiness in family living and, professionally, for: teaching in a family life and social science program; extension service work in family relations; study toward an advanced degree in marriage counselling or family relations.

*Child Development Major.* The curriculum for a major in Child Development includes the following: FL-CD 108, 150, 164, 174, 175; an additional 15 credits to be selected from FL-CD 20, 77, 115, 120, 125, 130, 180, 185; Education 133; English 122; Physical Education 81, 83, 84; Psychology 112, 121, 123, 135; Sociology 160; Social Work 165, 177; Speech 118, 167; Zoology 102. College of Family Life electives, three to six hours selected from Clothing & Textiles 5, 185; Food & Nutrition 9; Household Administration 149, and 155 or Business Administration 85.

*Child Development Minor.* If you desire to minor in child development you should take FL-CD 175 for three hours credit, and include in your program FL-CD 67, 68, 108, 174, plus four hours credit selected from other courses included in the child development major. The minor is recommended 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 such a setting as a child development laboratory.

*Marriage and Family Living Major.* The curriculum for a major in marriage and family living in-

cludes FL-CD 67, 68, 108, 120, 150, 180, 187; HA 155 or Bus. Ed. 85; Soc. 160 or SW 165; Psy. 112; Zoology 102 and nine hours selected from supporting courses in related fields.

*Marriage and Family Living Minor.* The curriculum for a minor is: FL-CD 120, 180, and either 67 or 100, with at least nine credit hours selected from other courses included in the Marriage and Family Living major.

*Teacher Certification.* If you expect to teach in kindergarten or elementary school, as a child development major, or a high school as a Marriage and Family Living major, you must meet the state requirements for teacher certification. It is recommended that you take a teaching certificate with your major. The teaching certificate fills the requirements for a minor for graduation in child development. Majors in Marriage and Family Living should take a teaching minor in some subject commonly taught in the high school.

*Counseling Service.* The Department of Family Living 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.

*Child Therapy Program.* In cooperation with the University Counseling Service and the Department of Psychology, the Department of Family Living and Child Development offers a service pro-

gram in child therapy. This service is available to any child who is between two and sixteen years of age, and whose psychological-emotional behavior seems to indicate the need for and the potential value of a therapeutic experience. Requests for information and consultation in regard to this service may be directed to the Department of Family Living and Child Development, or to the Coordinator of Counseling Services.

## FL&CD Courses

**20. Preparation for Marriage and Family Living.** Expectations of modern marriage; understanding of self; the problems of dating; courtship; engagement; relationship of husband and wife; family problems and adjustments. For men and women. (3F, W, S)  
Skidmore, Christensen, Carter

**67. Early Childhood.** To help develop a philosophy of family living as desirable background for the child; understanding of reproduction fundamentals of growth and development; a beginning concept of guidance. (3W, F, S)  
Lewis, Christensen

**68. Preschool Laboratory.** Directed observation in the Child Development Laboratory. Recommended to parallel FL&CD 67. (2F, W, S)  
Godfrey

**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. (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. (3F, W, S, Su)  
Carter

**108. Guidance of the Young Child.** Review of development principles with emphasis on social and emotional growth; fostering growth through creative materials and play equipment; guidance philosophy, principles and techniques. Two lectures. Two hours lab weekly, arranged at time of registration. Prerequisite: FL&CD 67, 68. (3F, W, S)  
Lewis, Christensen

**115. Growth of the Infant.** Readings in child development from conception to fifteen months of age, with discussion of infant care. Prerequisite: FL&CD 67. (3W)  
Lewis

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- 120. Marriage.** Engagement; marriage relationships; understanding of self. For men and women. (3F, W, S) **Carter**
- 125. Materials and Procedures in Family Life Education.** Study of parent, teacher, and community needs in relation to problems of education for family life. In-service training for teachers and group leaders in family life programs. Methods of family life education. (3S, Su) **Skidmore**
- 127. Family Life Workshop.** Designed for teachers and leaders to study the needs of parent, teacher, youth and community in relation to problems of education for family life. Resources, procedures, and organization techniques for initiation of and planning on-going programs. (1-3 Su) **Skidmore**
- 130. Play and Play Materials.** Play needs of children to twelve years of age, and kinds of play helpful to the convalescent child; dynamics and developmental levels of play, with study of play materials to enrich growth. (3S) **Godfrey**
- 135. An Introduction to the Theory and Practice of Play Therapy.** See Psychology 135. (3F) **Christensen**
- 150. Seminar.** Discussion of topics in current literature plus independent reading selected according to your interest. (2S) **Carter**
- 158. Sex Education.** Problems and procedures in teaching sex education to children, pre-school through adolescence. (2Su) **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. (3S) **Lewis**
- 174. Nursery School Methods.** Readings in research in nursery schools. Collections of materials for teacher-directed activities. Special consideration to understanding the needs of the nursery school child, with emphasis on the study of one child and a continuing evaluation of guidance procedures. Must parallel FL&CD 175. (3F, W, S) **Eames**
- 175. Practice Teaching in the Nursery School.** An opportunity to apply principles of child guidance in the nursery school. For Juniors and Seniors who have had a substantial amount of professional course work, including FL&CD 180. You must make arrangements for practice teaching well in advance of registration. (6F, W, S) **Eames**
- 180. Marriage Counseling.** The philosophy, principles, and techniques of pre-marital and marriage counseling. (3W, Su) **Skidmore**
- 185. The Family in Middle and Later Years.** Family development, and problems of grown children and their parents; parents on their own; understanding older family members. (3S, Su) **Skidmore**
- 187. Family Theory.** Differential conceptual approaches to the study of the family. Analysis of theories and points of view from various schools of thought. (3F) **Christensen**
- 190 Independent Study.** See Family Life 190. Credit arranged. (F, W, S, Su) **Staff**
- 205. Child Psychology and Guidance.** See Psychology 205. (3F, W, S) **Frandsen**
- 208. Advanced Seminar in Child Guidance.** Study and analysis of theories and philosophies of central importance in defining the nature, process, and structure of child guidance. Individual study and observation of children within the context of a guidance emphasis. (3S, Su) **Christensen**
- 235. Observation and Case Analysis in Play Therapy.** See Psychology 235. (3W) **Christensen**
- 238. Practice in Play Therapy.** See Psychology 278. (3F, W, S) **Christensen**
- 250. Advanced Seminar in Family Living and Child Development.** Discussions of current readings in family living and child development, with emphasis on development of insight and self-understanding. (3S, Su) **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. (S, Su) **Eames**
- 290. Independent Study.** See Family Life 290. Credit arranged. (F, W, S, Su) **Staff**
- 295. Research for Master's Thesis.** See Family Life 295. Credit arranged. (F, W, S, Su) **Staff**

Department of

## Food and Nutrition

PROFESSORS *Elna Miller, Ethelwyn B. Wilcox*; ASSOCIATE PROFESSOR *Inez L. Schoulte*, HEAD; ASSISTANT PROFESSORS *Priscilla Rowland, Dexter Rogers*; INSTRUCTOR *Margaret B. Merkle*.

## Office in Family Life 104-D

The Food and Nutrition Department can contribute importantly to your life and provide valuable experience for you in personal and family living. The courses which prepare you for high school teaching include FN 24, 25, 140, and one other upper division course.

The two majors in the department are (a) Food and Nutrition and (b) Dietetics. A major in Food and Nutrition is prepared for positions in food, nutrition and research. As a major in Dietetics you are prepared to take a student internship in an approved hospital, university or industrial plant operation which qualifies you to become a professional dietitian.

Majors in Food and Nutrition are required to take the courses as listed below:

Chemistry 10, 11, 12 and 190; Physiology 4; Bacteriology 10 or 70; FN 24, 25, 107,\* 140, 141, 145,\* 146 and 180.\*

A minimum of eighteen hours in other areas in the College of Family Life. Classes recommended in these area are: CT 5 and 8, FL&CD 20 and 67, HA 149 and 150 or 151.

Majors in Dietetics must select courses as outlined by the American Dietetic Association to meet the total number of required hours from each of the following groups: (Plan effective to 1965). Student see advisor regarding allowances for variations.

Group I	Quarter Hrs.
Basic Foods, required	12-15
Nutrition, required	
(Prerequisite or concurrent- 3 courses from Group II)	
Group II	Quarter Hrs.
Inorganic Chemistry, Chem. 10, 11	30-37
Organic Chemistry, Chem. 12	
Human Physiology, Physiol. 4	
Bacteriology, Bact. 10 or 70	
Physiological or Biological Chemistry, Chem. 190	
Food Chemistry	
Physics, Physics 6	
Other Advanced Nutrition Courses	
Group III	Quarter Hrs.
Psychology, Psych. 53, 102	18-30
Education, H. Ed. 120	
Sociology, Soc. 70	
Anthropology	
Economics, Ec. 51	
Personnel Relations	
Group IV	Quarter Hrs.
Experimental Foods	18-37
Diet Therapy	
Quantity Foods	
Institution Equipment	
Purchasing	
Organization and Management	
Accounting, BA 100	
Cost Control	

*Minor in Food and Nutrition.*  
Students from other colleges, as well as students from other areas in the College of Family Life, can select a minor in the Food and Nutrition Department.

Courses recommended for a minor are: FN 24, 25, 140, plus five additional hours to be selected by the student from other courses offered by the department.

\*Taught 1961-62.

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### Graduate Study

The Master of Science Degree is offered in Food and Nutrition. In cooperation with other departments a Master of Science degree is offered in Animal Nutrition and Biochemistry Interdepartmental Curriculum. (See Graduate School, Animal Nutrition and Biochemistry.)

The Department of Food and Nutrition cooperates with other departments at the University in offering courses on the graduate level leading to a Doctor of Philosophy degree. (See Graduate School, Animal Nutrition and Biochemistry.) Detailed information may be obtained from the Department.

### Food and Nutrition Courses

**5. Principles of Nutrition.** The relation of food to family health; factors influencing the body's nutritive requirements; problems applicable to individual interests. (3F, W, S)

Rowland

**9. Nutrition and Food Management.** A study of the scientific principles of nutrition and their application to the selection, purchasing, and preparation of family meals. For men and women. Not to be taken as part of the Food and Nutrition major. Two lectures and 1 lab. (3F, W, S)

Schoulte

**24. Nutrition and Food Preparation.** Fundamentals of nutrition, food selection, and preparation with application to the family. Three lectures and two labs. (5F, W, S)

Merkley

**25. Meal Preparation for the Family.** Planning, preparing, and serving family meals with consideration of the nutritional needs and finances of the family. Prerequisite: FN 24 (3F, W, S)

Schoulte, Merkley

**100. Quantity Food Preparation for Home-making Education Students and School Lunch Personnel.** Planning, preparation and serving of foods in large quantities with emphasis on food for special occasions and adequate school lunches. (3S)

Schoulte

**\*107. Experimental Cookery.** Development of experimental methods; their application to investigation in cookery and food preservation; a study of the literature in the field. Prerequisites: Organic Chemistry, FN 24. (4W or S)

Merkley

**135. Weight Control.** Individual help will be given to those students who need to lose or to gain weight. Diets will be planned to fit the individual's needs. Help with personal problems will be given by personal counseling sessions. (2S)

Wilcox, Dyer

**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 determination of nitrogen, mineral, and ascorbic acid. Three lectures and two labs. Prerequisite: Organic Chemistry. (5F, W)

Merkley, Wilcox

**141. Child Nutrition.** Nutritional requirements of the mother during pregnancy and lactation; nutrition of child through infancy to adolescence. Prerequisite: FN 5 or 140. (2S)

Wilcox

**\*145. Diet Therapy.** Application of dietetic principles to problems of diseases, with calculations and preparation of dietaries in diseased conditions. Three lectures and one lab. Prerequisite: FN 140. (4S)

Schoulte

**146. Food Technology.** Manufacture and preservation of food products; influence of those processes on physical, chemical, and nutritive values of foods. Prerequisites: Bacteriology 10 or 70, FN 24. One lecture and one lab. (2F, Su)

Merkley

**150. Seminar.** Reports and discussions on current literature. (1W)

Staff

**\*180. Quantity Food Preparation.** Principles of food cookery applied to large quantity preparation; standardization of food quality, menu planning and study of production costs. University's food service units used as laboratories. The course is planned particularly for juniors and seniors majoring in dietetics or institutional management. (5W)

Schoulte

**\*182. Institutional Organization, Management and Cost Control.** Principles of scientific management applied to food service units. Emphasis on organization of large food service units, on personnel management and human relationships, sanitation problems, the keeping of adequate records, specification writing, purchasing methods, and varied aspects of money management as it affects food service in institutions. (5S)

Schoulte

**185. Recent Progress in Human Nutrition.** A review of recent developments in human nutrition. You are required to participate in the Weight Control Conference. (3 Su)

Wilcox

\*Taught 1961-62.

## Homemaking Education 169

190. **Independent Study.** See Family Life 190. Credit arranged. (F, W, S, Su) **Staff**

201. **Laboratory Methods in Food and Nutrition.** Problems in food and nutrition, including nitrogen, mineral and vitamin determination. Prerequisite: Organic Chemistry. Credit arranged. (F, W, or S) **Rogers, Wilcox**

202. **Biological Assay of Foods.** Problems in biological assay of vitamins in foods. Credit arranged. (F, W, or S, Su) **Wilcox**

203. **Nutrition Laboratory.** Micro-chemical determinations of vitamins and other constituents in small amounts of blood. Prerequisite: Chemistry 190 or equivalent. Credit arranged. (F, W, or S) **Wilcox**

207. **Advanced Experimental Foods.** Development of experimental method and its application to cookery, and preparation for independent investigation of foods. Credit arranged. (F, W, or S) **Staff**

\*230. **Readings in Nutrition.** Critical review of the literature, relating to energy, metabolism, proteins, fats, and carbohydrates. Prerequisite: FN 140. (2S) **Rogers, Wilcox**

231. **Readings in Nutrition.** Critical review of literature in the field of vitamins and mineral metabolism. Prerequisite: FN 140. (2S) **Rogers, Wilcox**

243. **Nutrition and Growth.** Relation of nutrition to growth from the prenatal period to old age. (2S) **Wilcox**

**Nutrition and Biochemistry Seminar.** (See AH 270)

290. **Independent Study.** See Family Life 290. Credit arranged. (F, W, S, Su) **Staff**

291. **Graduate Seminar.** Credit arranged. (F, W, S) **Wilcox**

295. **Research for Master's Thesis.** See Family Life 295. Credit arranged. (F, W, S, Su) **Staff**

\*Taught 1961-62.

### Department of

## Homemaking Education

ASSISTANT PROFESSOR *Virginia H. Harder*, HEAD; INSTRUCTOR *Norma W. Pierson*.

### Office in Family Life 104-B

Purpose of Homemaking Education is to prepare you for professional employment as a home-making teacher and to provide experiences valuable to you in personal and family living. A Bachelor of Science degree and a Master of Science degree may be earned in Homemaking Education.

In addition to filling University group requirements you should keep in mind Homemaking Education prerequisites: Psychology 53, Business Economics 85, Chemistry 10, 11, 12.

The composite major requirements are: Clothing and Textiles 5, 24, 25, 33, 165. In addition, either CT 125 or 170 must be selected. Family Living and Child Development 67, 68, and 108. An additional

six hours must be selected from FLCD courses 77, 120, 125, 180, 185, 187, or Psychology 202. Food and Nutrition 24, 25, 140. An additional three hour class selected from FN 100, 107, 135, 141, 146. Household Administration 65, 149, 150, 155. Family Health 152.

A Home Project, conducted during the summer following completion of Clothing and Textiles 25, is required of all Homemaking Education majors. This project is under the direction of the Clothing and Textiles Department.

You may wish to consider developing a subject interest into a teaching minor: e.g., Visual Arts, Secretarial Science, English, Music, Physical Education, Social Science, Chemistry, Journalism, etc.



## 170 College of Family Life

Certification Requirements for Teachers of Vocational Homemaking in Secondary Schools.

Family Living and Child Development 100 or Psychology 100; Psychology 102; Public Health 154 or 155; Education 111, 114; Homemaking Education 120, 121, 122.

A total of 33 credits in professional education (outlined above) must be taken to meet requirements for the General Secondary Certificate, which includes the Vocational Homemaking Certificate.

*Services Available to Teachers:* (1) Guidance and help in meeting requirements for renewing certificates; (2) Opportunity to meet certification requirements; (3) Advanced study leading to Master of Science degree in Homemaking Education; (4) In-service Education.

### Graduate Study

The College of Family Life offers a composite graduate program designed to serve homemaking teachers and extension specialists in home economics. This program is planned to meet professional certification requirements for secondary homemaking teachers and may terminate in a Master's degree. The program is flexible, to meet individual needs.

The Master's program is administered by the Department of Homemaking Education. However, direction of the individual research program is guided by the instructor in the specific area you select for research. It is desirable that a graduate committee be established during your first quarter of residence. This committee will thereafter approve your graduate study program and will guide you on the thesis problem. (See Catalog section on School of Graduate Studies

for regulations on admission and candidacy for an advanced degree.)

The basic plan for teachers features a three-summer program of residence on campus. Research work may be conducted during the school year in on-going classroom situations. Extension service personnel may prefer one quarter on campus during each of three successive years. Research work in this program, however, can also be conducted in relation to employment activities.

*Extension Service Curriculum.* Courses required for entering the USU Extension Service as a County Home Agent 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 Home Agents. Plans for this training are made with the Director of Extension Service.

### Homemaking 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 experiences and projects, 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 102. (3F, S) **Harder**

**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 you register with the instructor of Homemaking Education 121 and 122 one quarter prior to your student teaching. This provides the time necessary to arrange teaching assignments with cooperating schools. (4F, W) **Harder**

## Household Administration 171

**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. (8F, W) **Staff**

**190. Independent Study.** See Family Life 190. Credit arranged. (F, W, S, Su) **Staff**

**217. Current Developments in Homemaking Education.** Newer developments in homemaking at the secondary level. Serves advanced undergraduate or graduate students. You may arrange with instructor to substitute this class for Homemaking Education 120. (3Su) **Harder**

**237. Seminar.** Opportunity for investigation and reporting on individual problems. Credit arranged. (F, W, S, Su) **Staff**

**290. Independent Study.** See Family Life 290. Credit arranged. (F, W, S, Su) **Staff**

**295. Research for Master's Thesis.** See Family Life 295. Credit arranged. (F, W, S, Su) **Staff**

### Department of

## Household Administration

ASSOCIATE PROFESSOR *Rhea H. Gardner*; ASSISTANT PROFESSORS *Edith Nyman*, HEAD, *Haruko Terasawa*.

### Office in Family Life 204-B

The Department of Household Administration provides an opportunity for you to combine training for homemaking with training for professional employment. The program provides an opportunity for you to select courses from the academic offerings of the entire University.

A major in the department combined with a minor in either Clothing and Textiles, Food and Nutrition, or Family Living and Child Development, would give training for a wide variety of commercial and teaching openings. A Master's degree prepares one for University teaching.

*Major:* The curriculum for a major in Household Administration includes: H.A. 65, 100, 149, 150 or 151, 155; Clothing-Textiles 5, 33; Foods-Nutrition 24, 25; Family Life-Child Development 100, 20 or 120, 110; Landscape Architecture 3; Speech 105; Journalism 112.

*Minor:* The curriculum for a minor includes 12 hours to be selected from HA 65, 100, 149, 150, 155 and FLCD 67, 68, 20 or 120. The minor would be developed to meet your individual needs.

Suggested electives: English 5, 34, 35, 36, 53, 58; History 4, 5, 6, 13, 14; Political Science 5; Horticulture 4, 11; Speech 83; Journalism 12, 13, 14; Philosophy 45; Accounting 20; Clothing and Textiles 24; Economics 106, 170; FAM 183; FAA 135; Food and Nutrition 100; Clothing and Textiles 185; Physical Education 81, 83; Horticulture 100, 118; Sociology 170, 130; Psychology 145, 185; any upper division Literature, History or Political Science.

### Graduate Study

The Department of Household Administration offers work leading to the Master of Science Degree, emphasizing the areas of Family

## 172 College of Family Life

Finance, Household Equipment and Home Management. Flexibility in program planning provides opportunities for developing your individual strengths and interests. Course work is arranged in cooperation with other departments of the University such as Economics, Sociology, Psychology, Physics, Family Living and Child Development, Food and Nutrition, and Clothing and Textiles.

### Household Administration Courses

**65. Housing.** A consideration of various aspects of housing: finance, location, planning and orientation, construction, remodeling and expansion. (3F, W, S) **Ream**

**100. Household Equipment.** Principles of selection, operation, care and arrangement of household equipment. (2F, S) **Nyman**

**149. Home Management.** A study of the management of family resources in the achievement of family goals. (3F, W, S) **Nyman**

**150. Home Management House.** Residence in a Home Management House for a five-week period provides experience in management and democratic family living. Application must be made in advance of registration with resident advisor. Girls without required prerequisites may apply for one five-week period during winter quarter. Prerequisites FN 24, 25; HA 149. (4F, W, S, Su) **Nyman**

**151. Home Management Problems.** Similar to 150; for married students. Provides guidance in the management of their own home. (4S, Su) **Nyman**

**155. Family Finance.** The planning of family finances and a study of factors that influence the decision and planning in the economic area. (2F, W) **Nyman**

**190. Independent Study.** See Family Life 190. Credit arranged. (F, W, S, Su) **Staff**

**290. Independent Study.** See Family Life 290. Credit arranged. (F, W, S, Su) **Staff**

**295. Research for Master's Thesis.** See Family Life 295. Credit arranged. (F, W, S, Su) **Staff**

## Combination Major in

# Family Life and Secretarial or Clerical Practice

This is a program for women who desire basic training for family life plus sufficient secretarial or clerical training to provide professional opportunities outside the home. For a Bachelor of Science degree with this combination major you complete the following Family Life courses and either the Secretarial or the Clerical courses here listed, plus the University group requirements listed in the Catalog.

### FAMILY LIFE COURSES

#### Household Administration

9 hours to be selected from:

H.A. 65	Housing .....	3
H.A. 100	Household Equipment.....	3
H.A. 149	Home Management.....	3
B.E. 85	Consumer Education.....	3

#### Clothing Textiles

12 hours to be selected from:

*C.T. 5	Art in Everyday Living.....	3
C.T. 8 or 25	Clothing Construction.....	3
C.T. 24	Textiles .....	3
C.T. 33	Home Furnishings.....	3
C.T. 185	Family Clothing.....	3

#### Foods and Nutrition

8 hours to be selected from:

*F.N. 24	Food Selection and Preparation .....	5
Elective	.....	3

#### Family Life-Child Development

12 hours to be selected from:

FLCD 67	Early Childhood.....	3
FLCD 68	Preschool Laboratory.....	2
FLCD 108	Guidance of the Young Child .....	3
FLCD 100	Human Growth and Development .....	3

FLCD 110	Family Development.....	3
FLCD 115	Growth of the Infant.....	3
FLCD 180	Marriage Counseling.....	3
FLCD 185	The Family in Middle and Later Years.....	3
FLCD 20 or FLCD 120	Preparation for Marriage and Family Living.....	3
	Marriage .....	3

\*Required classes

### SECRETARIAL COURSES

S.S. 51	Intro. to Sec. Science.....	2
S.S. 43	Adv. Type.....	2
S.S. 65	Filing .....	3
S.S. 92	Business Machines.....	2
S.S. 167	Office Practice.....	2
S.S. 175	Office Management.....	3
S.S. 186, 187	Secretarial Procedures.....	6
B.A.1 <sup>1</sup>	Accounting .....	4
S.S. 141, 142, 143	Dictation and Transcription I, II, III .....	15
B.A. 143	Business Communication.....	3

Total 42

### CLERICAL COURSES

S.S. 30	Business Communications.....	2
S.S. 51	Intro. to Secretarial Science	2
S.S. 42	Inter. Type.....	2
S.S. 43	Adv. Type.....	2
S.E. 65	Filing .....	3
S.S. 92	Business Machines.....	2
S.S. 94	Posting Key-driven Machines .....	2
S.S. 96	Posting Machines.....	2
S.S. 167	Office Practice.....	2
S.S. 175	Office Management.....	3
S.S. 186, 187	Secretarial Procedures.....	6
B.A. 30	Business Mathematics.....	3
B.A. 5	Business Law.....	3
B.A. 1	Accounting .....	4
B.A. 2	Accounting .....	4

Total 41

<sup>1</sup>It is recommended that B.A. 2 also be completed. 4 hours.





*College of Forest, Range and  
Wildlife Management*



College of

Forest, Range and  
Wildlife Management

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**Degrees Offered:**

Bachelor of Science  
Master of Forestry  
Master of Science  
Doctor of Philosophy

*College of*

# Forest, Range and Wildlife Management

J. Whitney Floyd, Acting Dean

Office in Forestry and Biological Science 103

Increasing activity in the fields of forest management, range management, wildlife management, 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 conservation and management of wild lands and their resources so that they may be of continuing benefit for present and future generations of citizens.

*The favorable geographical location* of this College of Forest, Range, and Wildlife Management 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 percent 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 range 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.

*The curricula of this College pre-*

pare you for positions with federal or state agencies and for private work in (1) forest management, (2) range management, and (3) wildlife management. As a forest management student you may choose between three options: one designed to train for general forestry work, as with the public land managing agencies, one more strictly for timber management, and one in forest recreation management. As a range management student you may specialize in general range management, forest-range management, or watershed management. As a wildlife management student you may select a curriculum to train either for game management or fishery management.

You will make more satisfactory progress if you have had two years of high school algebra, geometry, and also chemistry, physics, typing, and biology. Four years of English are also desirable. It is important that you have an interest in and an aptitude for studying natural science. 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 Admission's Office. Transfer students should send, in addition to their college transcript,

## 178 College of Forestry

a letter of recommendation from their former dean or adviser and their high school transcript. These should be sent directly to the dean of the Forestry College.

*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 Management Department or the Forest-Range Management option offered by the Range Management Department. Any properly qualified student in the College may attend if he desires and makes suitable arrangements prior to the camp period. The camp opens soon (usually the first Monday) after the end of the 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 school 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 you should be inoculated against Rocky Mountain spotted fever.

As a transfer to this College from another school you should note that (a) completion of the camp program is required in the above-named courses of study; (b) it is prerequisite to professional forest management course work in the junior year; and (c) 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, each depart-

ment conducts an extensive field-problems trip in the spring quarter of the junior year, or the fall quarter of the senior year; this trip is required of all students. The trip for range management seniors is taken just before the fall quarter starts. The trip for forest management and wildlife management 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 \$40.00 is charged each student to defray the transportation expenses of the trip.

*Loan Funds.* Two sources of funds are available on a loan basis to worthy, deserving upper-division students in the College of Forest, Range, and Wildlife Management. These are the W. B. Rice Memorial Loan Fund and the Bureau of Land Management Fund. Loans are made for short periods. The funds are administered by a faculty committee and application should be made through the Dean's office.

*Graduation Requirements.* The following general requirements must be met for graduation from the College of Forest, Range, and Wildlife Management: (1) One hundred and ninety-two quarter credits, exclusive of basic Military Science, physical education, and forestry summer camp. (2) All courses prescribed under the study program of your chosen field. (3) Three hours of social science, in addition to general economics. (4) Proficiency in written and spoken English. If you are deficient in English you are required to pass certain supplementary or corrective courses in addition to regular requirements. (5) At least one summer of department-approved practical and qualifying work experience. In certain instances summer camp attendance may fulfill this requirement.

Department of

## Forest Management

PROFESSORS *J. Whitney Floyd*, HEAD, *T. W. Daniel*; ASSOCIATE PROFESSORS *Raymond R. Moore*, *S. Ross Tocher*; ASSISTANT PROFESSORS *Frank W. Kearns*, *John F. Vallentine*; COLLABORATOR *James L. Mielke*.

## Office in Forestry and Biological Science 101

Upon completion of any of the following three programs of study, you are granted the degree of Bachelor of Science in Forest Management. These three programs of study are designed to give you comprehensive training in all branches of Forest Management, including growing, protecting, harvesting, and utilization of timber crops. It is desirable that you know by the end of your sophomore year in which of these three options you will enroll:

(1) *The option in General Forestry* basically provides training in timber management. However, in recognition of the needs of several of the land and resource managing agencies, it also provides training in range management, and watershed management. This pattern of training meets the needs of personnel engaged in the administration of public forest lands.

(2) *The second option, Timber Management*, provides major emphasis on the growing, harvesting, and utilization of timber crops, and is appropriate training for employment in private forest industries or specialized timber work with the public forest managing agencies.

(3) *The third option, in Forest Recreation Management*, is designed to train you for employment with the National Park Service, the U. S. Forest Service, state departments of conservation, forestry or park services, or municipal park services. Suitable training in out-

door recreation organization, management, and supervision is provided, and in addition to this is given sufficient forestry training to qualify you for various federal Civil Service examinations and positions.

## Required Basic Courses

## FRESHMAN YEAR

Course	Quarter taught	and credit		
		F	W	S
English 1, 2, 3 .....		3	3	3
Mathematics 34, 35, 44 <sup>1</sup> .....		3	5	3
Chemistry 10, 11, 12 .....		5	5	5
Forest Management 1 .....	2	...	...	...
Range Management 1 .....	...	1	...	...
Wildlife Management 1 .....	...	...	...	1
Animal Husbandry 1, 2 <sup>2</sup> .....	3	...	...	2
Engineering Drawing 60 <sup>3</sup> .....	...	1	...	...
M.S., A.S., or P.E. <sup>4</sup> .....	1-2	1-2	1-2	1-2

## SOPHOMORE YEAR

Course	Quarter taught	and credit		
		F	W	S
Botany 24, 25, 30 .....	5	5	5	5
Botany 120 .....	...	...	...	5
Civil Engineering 81, 80 .....	3	3	...	...
Physics 6 .....	...	5	...	...
Agronomy 58 .....	...	...	...	5
Economics 51 .....	5	...	...	...
Speech 105 .....	...	3	...	...
Geology 3 .....	5	...	...	...
M.S., A.S., or P.E. <sup>4</sup> .....	1-2	1-2	1-2	1-2

<sup>1</sup>Students presenting 1½ units 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>Not required of students taking the Timber Management option.

<sup>3</sup>Not required of students who have had adequate training in engineering-mechanical drawing in high school.

<sup>4</sup>P.E. is 1 credit; M.S. and A.S. are each 2 credits.

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## SUMMER CAMP

Course	Credit
Forest Management 96 .....	3
Forest Management 97 .....	4
Range Management 98 .....	1
Wildlife Management 99 .....	1

## A—GENERAL FORESTRY

### JUNIOR YEAR

Course	Quarter taught and credit
	F W S
Forest Management 106, 107.....	4 3
Forest Management 112, 113.....	3 2
Forest Management 114, 115.....	3 3
Forest Management 118 .....	3
Forest Management 132 .....	3
Forest Management 137 .....	3
Forest Management 146 .....	3
Range 126 .....	5
Wildlife 150 .....	5

### SENIOR YEAR

Course	Quarter taught and credit
	F W S
Forest Management 119 .....	3
Forest Management 120 .....	3
Forest Management 121 .....	4
Forest Management 122, 123 .....	4 3
Forest Management 126 .....	3
Forest Management 133 .....	2
Forest Management 134 .....	3
Forest Management 147 .....	2
Range 131 .....	4
Range 162 .....	5
Range 180 .....	4
English 111 .....	3

## B—TIMBER MANAGEMENT

If you choose the Timber Management option, add the following courses to those of the General Forestry option and omit Range Management 131, 180, and Forest Management 119:

Course	Quarter taught and credit
	F W S
Forest Management 116 .....	2
Forest Management 125 .....	3
Forest Management 129 .....	2
Forest Management 130 .....	4
Forest Management 131 .....	3
Zoology 105 .....	3
Botany 140 .....	4

## C—FOREST RECREATION MANAGEMENT

If you choose the Forest Recreation Management option you take the same schedule as General Forestry with the exception of Animal Husbandry 1 and 2; plus the following courses:

Course	Quarter taught and credit
	F W S
Landscape Architecture 130 .....	2
Forest Management 138 .....	2
Forest Management 139 .....	3
Civil Engineering 120 .....	4
Landscape Architecture 3 <sup>1</sup> .....	3

<sup>1</sup>Taken in spring quarter of freshman year.

## Graduate Study

*The degree of Master of Science* in Forest Management 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. Normally you are required to take all of the courses in the 200 series taught in the Forest Management Department. One or two years may be required, depending upon whether you are able to devote full or only part time to your studies. As an applicant you should submit an official transcript of your college courses and an official application for admittance to the dean of the School of Graduate Studies. Application forms may be obtained at his office.

*The Master of Forestry degree* program is available to students possessing a non-forestry Bachelor's degree, with acceptable scholarship. The requirements include completion of the required, basic lower division courses, the forestry summer camp program, the required upper division Forest Management curriculum, and ten units of graduate (200 series) course work. This program may require two or more years, depending upon how closely related your undergraduate work is to forestry. For this program you should apply as described in the paragraph above.

**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. Students having the Bachelor's or Master's degrees should contact the department head for information concerning eligibility for study toward this degree.

**Graduate assistantships** are available to graduate students in Forest Management. Application for assistantships should be made to the head of the Forest Management Department.

## Forest Management 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. (2F) **Floyd**
- 10. Forest and Range Conservation.** An introduction to conservation problems designed to acquaint you 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 Forest, Range, and Wildlife Management. (2W) **Box**
- 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) **Tocher**
- 96. Forest Surveying.** Practical field problems in surveying methods commonly employed in Forest, Range, and Wildlife Management. Lab. Fee \$5. (Summer camp 4 credits) **Tocher, Daniel, 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 3 credits.) **Tocher, Daniel, 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 Management majors. Prerequisites: Range 126 and Summer Camp. (4F) **Daniel**

- 104. Forest Management and Economics.** Organization of a forest for production; surveys, normal and actual growing stock, determination of allowable harvest, management plans; economics influencing management. Not open to Forest Management majors. Prerequisite: Forestry 103. (3S) **Moore**
- 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. (3S) **Moore**
- 112. Dendrology I. Hardwoods.** Identification, distribution and silvics of the more important forest trees in the United States. Prerequisite: Summer Camp. (3F) **Kearns**
- 113. Dendrology II. Conifers.** Identification, distribution, and silvics of the more important forest trees of the United States. Prerequisite: Summer Camp. (2W) **Kearns**
- 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. (3S) **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. (2S) **Daniel**
- 118. Forest Protection I.** Prevention, pre-suppression and suppression of forest and range fires, including economic and physical effect; fire behavior. Field trips. (3F) **Floyd**
- 119. Forest Protection II.** Problems of administration and economics in protecting forests from biological enemies. Prerequisite: Forestry 115, 121. (3W) **Staff**
- 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. Prerequisite: Forestry 107, 115. (4F) **Moore**



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**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)

Kearns

**123. Forest Economics.** Economic problems involved in the utilization of forest land and timber, and in the distribution of forest products. Prerequisite: Forestry 122. (3S)

Kearns

**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. (3F)

Tocher

**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. (4S)

Staff

**131. Forest Products Marketing.** Principles of marketing applied to lumber and other forest products. (3S)

Kearns

**132. Public Land Administration.** Organization and functions of conservation agencies affecting range, forest, and wildlife administration; personnel management problems. (3W)

Floyd

**133. Forest History and Policy.** Development of federal, state, and private forest policy. (2W)

Staff

**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. Prerequisite: Forestry 97. (3F)

Tocher

**137. Improvements and Recreation.** Recreational use of forests and the classifications and planning of areas suitable for this purpose. Field trips. (3F)

Floyd

**\*\*138. Recreational Land Classification.** Land classifications and economics of various forms of forest recreational use. (2S)

Floyd

**\*139. Recreational Structures.** Construction of various forest recreational facilities. (3W)

Tocher

**145. Forest Problems.** Individual study and research upon a selected forestry problem approved by the instructor. (1-3F, W, S)

Staff

**146. Junior Field Problems.** Study of forest operations. Junior year. Fee \$40. (3S)

Staff

**147. Forest Seminar.** Systematic review of Forestry. (2S)

Floyd

**201, 202, 203. Advanced Forestry Seminar.** Review and discussion of advanced current literature. (1F, 1W, 1S)

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 silvics and silviculture, with emphasis on physiological aspects of both subjects. (3W)

Daniel

**206. Forest Management and Valuation.** Application of forest management principles; forest organization and development; forest regulation, valuation and control of operations. (2F)

Moore

**207. Forest Protection.** Advanced study in specialized fields of forest protection. (2W)

Floyd

**208. Forest Measurements.** Application of statistical measurements to forest problems. (3F)

Moore

**209. Forest Economics.** Study of the interaction of markets on the demand for lumber and forest products. (2F)

Kearns

**210. Forest Problems.** Individual advanced study upon a selected forestry problem. (2 to 10F, W, S)

Staff

**211. Thesis.** Original research on a problem in Forest Management, to be concluded by preparation of a thesis. (10 to 15F, W, S)

Staff

\*Taught 1961-62.

\*\*Taught 1962-63.

*Department of*

# Range Management

PROFESSORS *L. A. Stoddart*, HEAD, *C. Wayne Cook*, *Arthur D. Smith*;  
ASSISTANT PROFESSORS *T. W. Box*, *DuWayne L. Goodwin*, *Phil R. Ogden*,  
*John F. Vallentine*.

## Office in Forestry 306

A four-year program leading to the degree of Bachelor of Science in Range Management is available. Opportunity is given under this program to specialize in General Range Management, Forest-Range Management, or Watershed Management.

Graduates are qualified for positions such 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, Indian Service, 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 management 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.

*Required Basic Courses.* You must complete a core of basic course work as outlined below. In consultation with your adviser, you must elect other course work to meet your personal objective in training. You must obtain from your adviser approval of a complete study program before becoming a candidate

for a degree. It is recommended that this be done as early as possible and, in no instance, later than the junior year.

During the freshman and sophomore years, all range majors must complete the following:

Course	Minimum quarter-hour credits
English .....	9
College algebra and trigonometry.....	8
Chemistry, including organic .....	15
Botany, including taxonomy.....	15
Physics .....	5
Economics .....	5
Soils .....	5
Geology .....	5
General Zoology .....	5

During the junior and senior years you must complete the following:

Plant ecology .....	5
Plant physiology .....	5
Range plant communities .....	10
Watershed management .....	4
General range management.....	5
Range field problems.....	3
Range technical problems.....	3
Range improvement .....	3
Range seminar .....	6

The following fields of specialization are recognized in the department:

(1) *General Range Management.* Elective course work should emphasize range management and animal husbandry. The student is fitted for management of range lands, public range land administration, and private range operation.

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(2) *Forest-Range Management.* Elective course work in forest management should be emphasized, including summer camp. This option provides training for multiple use management of forest and range lands. The student is especially fitted for work with the U. S. Forest Service.

(3) *Watershed Management.* Elective work should emphasize mathematics, soils, and hydrology. Sophomore students should take Plane and Solid Analytical Geometry, Integral Calculus, and Differential Calculus. With proper selection of elective subjects, you may qualify for employment as a forester, forester (research), or as a range conservationist.

*Minor in Range Management.* The following courses in Range Management are suggested for students who wish to minor in the field (requirements subject to approval by the Range Department): Range 126, Plant Ecology, 5 credits; Range 160, Principles of Managing Range Lands, 5 credits; Range 161, Range Analysis Techniques, 1 credit; Range 130, 131, 132, Range Plant Communities, 10 credits; Range 163, Range Improvement, 3 credits; Range 181; Range Economics, 3 credits.

### Graduate Study

The degree of Master of Science in Range Management is granted upon completion of an arranged course of study. Adequate facilities are available to allow emphasis upon such related fields as forestry, soil conservation, animal husbandry, botany, wildlife, economics, or soils. A Bachelor's degree in range management or a related subject is prerequisite to advanced study.

To a selected few students, a pro-

gram of instruction and research leading to the degree of Doctor of Philosophy also is offered. Students having the Bachelor's or Master's degree should contact the department head for information concerning eligibility for study toward this degree.

*Assistantships.* There are available to graduate students a number of assistantships which will defray most of the costs of attending school, including exemption from non-resident tuition fees. Such assistantships involve part-time work for the Department. Several of these assistantships are available each year, and interested students should apply to the department head for further details.

### Range Management Courses

1. **Elements of Range Management.** Introduction to problems and methods in range management. (1W) **Stoddart**

98. **Range Analysis.** Field identification of summer range plants. Methods and techniques of vegetation analysis. Practice in range allotment analysis. (1 credit, Summer Camp) **Box**

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, general soils. Lab fee \$1. (5F, S) **Stoddart**

130. **Grassland Communities.** Composition, distribution, successional patterns, and management of grassland ranges. Prerequisite: Plant taxonomy. Two lectures, one lab. (3W) **Box**

131. **Forest Range Communities.** Composition, distribution, successional patterns and management of forested ranges. Prerequisite: Plant Taxonomy. Two lectures, two labs. Lab. fee \$2. Saturday field trips may be scheduled. (4F) **Box**

132. **Desert Communities.** Composition, distribution, successional patterns, and management of desert ranges. Prerequisite: Plant taxonomy. Two lectures, one lab. Lab fee \$4. Saturday field trips may be scheduled. (3S) **Box**

**160. Principles of Managing Range Lands.** A general course designed to give a knowledge of how to evaluate, manage, and perpetuate ranges. (5F) **Cook**

**161. Range Analysis Techniques.** Theory, application, and limitations of vegetation analysis methods and techniques. Field practice in vegetation sampling and range analysis. To be taken concurrently with Range 160. Credit not allowed those with credit in Range 98. Lab fee \$3. Field trips to be arranged. (1F) **Box**

**162. Range Management.** Problems in managing native range lands; maintenance of production; utilization of range forage; and range livestock management. Prerequisite: Summer Camp. (5S) **Box**

**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) **Vallentine**

**164. Technical Problems in Range Management.** Specialized problems in range administration and management encountered by the technician. Prerequisite: Range 160 or 162. (3W) **Stoddard**

**180. Watershed Management.** Management of timber and forage producing lands to produce maximum quantities of high quality water without loss of stability. Prerequisite: Plant Ecology. Three lectures, one lab. Lab. fee \$4. Saturday field trips may be scheduled. (4F) **Goodwin**

**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: General range management. (3W) **Box**

**192. Range Seminar.** Discussion by specialists in various phases of land use management. Prerequisite: Senior classification. (2F) **Smith**

**193. Range Seminar.** Supervised discussion and review of range animal literature. Prerequisite: Senior classification. (2W) **Box**

**194. Range Seminar.** Supervised discussion and review of range plant literature. Prerequisite: Senior classification. (2S) **Box**

**195. Range Problems.** Individual study and research upon a selected range problem. Prerequisite: Faculty approval. (1 to 3 F, W, S, Su) **Staff**

**196, 197. Range Field Problems.** Field study of range operation and research. Lab. fee \$35. Prerequisite: Plant Ecology and Plant Communities. (3F) **Box**

**200. Range Thesis.** Original research and study on a problem in range management. (1 to 15 F, W, S, Su) **Staff**

**204. Land Use Seminar.** Current problems and practices in wildland management, with emphasis on western range. (2F) **Smith**

**\*205. Seminar in Range Nutrition.** Problems in management and research in the field of plant and animal nutrition on range land. Prerequisite: Feeds and Feeding. (3W) **Cook**

**\*\*206. Research Methods.** A study of research methods in range management and related subjects. Prerequisite: Statistics. (3W) **Cook**

**207. Graduate Seminar.** Review of current research in range management by graduate students and faculty. (1S) **Box**

**\*\*210. Environmental Factors.** Environmental factors and interaction between organisms and environment as found on native range land. Prerequisites: Plant Ecology and Plant Physiology. (3W) **Goodwin**

**\*211. Synecology.** Development, structure analysis, and classification of native range vegetation. Prerequisite: Plant Ecology. (3W) **Goodwin**

**\*280. Advanced Watershed Management.** Advanced study of technical problems encountered in watershed management. Prerequisite: Watershed Management. (2S) **Goodwin**

**\*281. Advanced Range Economics.** Advanced study of economic factors affecting conservation practices with special consideration to range lands and range operations. Prerequisite: Range Economics. (2S) **Smith**

\*Taught 1961-62.

\*\*Taught 1962-63.

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## Department of

# Wildlife Management

PROFESSORS *William F. Sigler*, HEAD, *George H. Kelker*; ASSOCIATE PROFESSORS *Jack H. Berryman*, *Allen W. Stokes*; ASSISTANT PROFESSORS *William T. Helm*, *John M. Neuhold*; RESEARCH ASSISTANT *Susan Martin*; TEACHING ASSISTANT *H. W. Williams*; COLLABORATORS *Norman G. Benson*, *Ross V. Bulkley*, *Jessop B. Low*.

## Office in Forestry 302-B

Students majoring in this department may choose either of two options: Wildlife Management and Fisheries. Both lead to the degree of Bachelor of Science in Wildlife Management.

The Wildlife option prepares students particularly for management of wildlife; the Fisheries option for positions in fishery management, both freshwater and marine.

## Program of Studies

In your first two years you will take courses designed to give you a sound scientific background. By the beginning of your Junior year you should decide with your advisor upon a course of studies for your final two years. Besides choosing an option you will want to select courses to meet your particular professional goal.

During the Freshman and Sophomore years you should complete the following:

English 1, 2, 3 .....	9
College algebra and trigonometry .....	8
Chemistry, including organic .....	15
Botany, including taxonomy .....	15
Zoology: invertebrate, vertebrate and entomology .....	15
Physics .....	4
Economics .....	5
Soils .....	5
Survey courses in forest, range, and wildlife management .....	4
Military or Air Science, or Physical Education .....	6

Electives from associated departments are chosen by you with approval of your major professor. Recommended electives include: all courses in Wildlife, Range, or Forestry; Applied Statistics 132, 141; Botany 112; Chemistry: organic, physical, or biochemistry; Civil Engineering 81, 171; Animal Husbandry 150; Geology 3; Journalism 112, 120; Photography 51; Physical Education 36; Physiology 4, 121, 122, 131; Zoology 112, 116, 119, 121, 122, 128, 129.

### Required for Graduation of All Wildlife Students

Wildlife 145, Principles of Wildlife Management .....	3
Wildlife 157, 158, 159, Seminar (Senior Year) .....	3
Wildlife 160, Animal Ecology .....	5
Wildlife 172, Problem Orientation .....	3
Wildlife 175, Wildlife Law Enforcement .....	3
Range 126, Plant Ecology .....	5
Applied Statistics 131, Statistical Methods .....	4
English 111 or 112, Advanced Writing....	3
Speech 105, Technical Speaking .....	3

In addition to these courses, you may choose one of the following options:

### Option A. Wildlife Management

Wildlife 146, Management of Upland Game .....	3
Wildlife 147, Management of Waterfowl and Furbearers .....	5
Wildlife 153, Management of Big Game .....	5
Zoology 122 or 121 .....	4
Related courses (See Below) .....	16-19

33 credits

## Wildlife Management 187

### Option B. Fishery Management

Wildlife 161, Limnology .....	4
Wildlife 165, Fishery Management .....	3
Wildlife 169, Techniques of Fishery Management .....	5
Zoology 155, Ichthyology .....	4
Related courses (See Below) .....	17

33 credits

## 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 provides eight research assistantships for graduate students in the department. The Wildlife Management Department has one teaching assistantship. In addition there are usually several grants from outside conservation agencies available to support graduate research. As a prospective student you should submit formal application with a transcript of college credits and references to the dean of the School of Graduate Studies. Inquiry as to admission should be directed to the head of the Department of Wildlife Management. Applications for assistantships should be directed to the Director of the Wildlife Research Unit or the head of the Department.

## Wildlife Management Courses

**1. Elements of Wildlife Management.** Introduction to the problems and methods of wildlife management. (1S) **Sigler**

**99. Wildlife Practice.** Integrated studies of wildlife populations in relation to land uses. Lab. fee \$5. (1 Summer Camp) **Kelker**

**145. Principles of Wildlife Management.** Characteristics of animals and their habitat in relation to general management practices. (3W) **Stokes**

**146. Management of Upland Game.** Taxonomy, life histories, distribution, environmental needs, and plans for management of game birds and small mammals. Two lectures, one lab. Prerequisite: Wildlife 145. (3F) **Stokes**

**147. Waterfowl and Furbearers Management.** Taxonomy, life histories, habitat requirements, economic importance, and plans for management of waterfowl and furbearers, especially muskrat and beaver. Prerequisite: Wildlife 145. Three lectures, field trips. (5S) **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. No credit allowed wildlife management majors. Five lectures; field trips arranged. (5F, S) **Kelker**

**153. Management of Big Game.** Life histories, distribution, numerical variation, enemies, and management activities for big game animals. Prerequisite: Wildlife 145 or 150. Three lectures, two labs, including field trips. (5W) **Staff**

**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. (3F) **Staff**

**Ichthyology.** Ecology, classification, and life histories of native and introduced fishes. Two lectures, two labs. (See Zoology 155) (4W) **Sigler**

**157, 158, 159. Wildlife Seminar.** Discussion of current developments in wildlife management. Two recitation periods per week. (1F, 1W, 1S) **Staff**

**160. Animal Ecology.** Distribution and behavior of animals as affected by various environmental factors. Special attention to inter-relationships of biotic communities. Three lectures, two labs, including field problems. (5F) **Stokes**

**161. Limnology.** Physical, chemical and biological factors affecting occurrence and productivity of fishes and other aquatic animals in fresh waters. Prerequisites: Botany 30, Zoology 13. Two lectures, two labs. (4F) **Neuhold**

**162. Fishery Biology.** Anatomy, development, respiration, and excretion of fresh water teleosts. Two lectures, two labs. (4W) **Neuhold**



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**165. Fishery Management.** Principles and techniques of lake, pond and stream improvements; ecology of game fishes, propagation methods, common fish diseases. Prerequisite: Zoology 155. Two lectures, one lab. (3S)

Sigler

**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. (3S)

Helm

**169. Techniques of Fishery Management.** Mechanics of collecting and analyzing life history material of fishes. Prerequisites: Zoology 155, Wildlife 161. Two lectures, three labs. (5W)

Neuhold

**170. Wildlife Problems.** Individual study and research upon a selected wildlife problem. (1 to 5F, W, S, Su)

Staff

**171. Field Problems.** Study of wildlife management operations of various agencies in the West. Fee \$35. (2F, S)

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. (3W)

Kelker

**175. Wildlife Law Enforcement.** Review of state and federal regulations of fish and game; discussions of apprehension of violators, collection of evidence and its use in court. (3W)

Sigler

**210. Advanced Field Problems.** Field training in techniques not covered in undergraduate courses. (1 to 5F, W, S)

Staff

**253. Advanced Big Game Management.** Population dynamics, census methods, hunting regulations, and management plans. Prerequisite: Wildlife 153 or equivalent. Two lectures, one lab. (3W)

Staff

**257. Graduate Seminar.** Discussion of problems in selection and writing of research projects; discussion of current problems. (2F)

Helm

**258. Graduate Seminar.** Discussion of current investigations by class members and by representatives of state and federal agencies. (2W)

Low

**259. Graduate Seminar.** Review of current literature. Discussion of the completion and publication of students' technical papers. (2S)

Neuhold

**260. Advanced Animal Ecology.** Population dynamics, and animal behavior. Prerequisite: Wildlife 160 or equivalent. (3W)

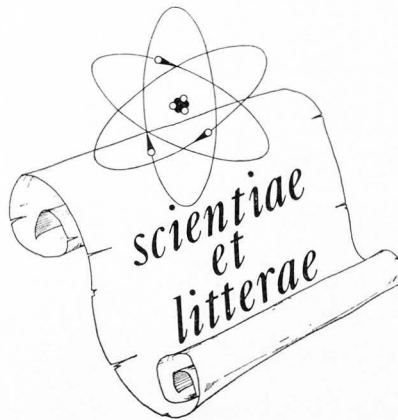
Stokes

**261. Advanced Limnology.** Advanced study of factors affecting productivity of fresh water. Prerequisite: Wildlife 161 or equivalent. Two lectures, two labs. (4F)

Sigler

**270. Research and Thesis.** Credit for field or laboratory research, library work, and thesis writing. (1 to 15F, W, S, Su)

Staff



*College of  
Humanities and Sciences*

## College of Humanities and Sciences

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**Degrees Offered:**

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Doctor of Philosophy

*College of*

# Humanities and Sciences

Carlton Culmsee, Dean

Office in Main 182

*Scope of College of Humanities and Sciences.* Besides providing basic courses for students enrolled in professional and technical divisions of the institution, the College of Humanities and Sciences enables all students in the University to lay the foundation for a liberal education. The need to understand our own culture as well as the cultures of other nations has never been so urgent as now. Such understanding is believed to be a path to permanent peace. Many courses in the College qualify you directly to play your part as an informed citizen in attempts to realize that great hope. The curricula of the College also enable you to major in any of the various departments and thus begin preparation for your career.

College of Humanities and Sciences includes the Departments of Bacteriology and Public Health; Chemistry; English, Journalism, and Photography; Geology; Landscape Architecture and Environmental Planning; Languages and Philosophy; Mathematics; Physics; Speech; Zoology.

## General Education

*Integrated Courses.* The following are broad courses which may be used to satisfy group requirements. They are listed here to facilitate selection and advisement.

## Biology

Administered by the staffs of the Departments of Bacteriology and

Public Health; Botany and Plant Pathology; Zoology, Entomology, and Physiology.

**1. Principles of Biology.** Basic principles of life as illustrated in plants and animals, with emphasis on concepts of fundamental importance, including organization of living things, energy relationships, growth, relation to environments, kinds of living things, reproduction, development, inheritance, and evolution. Five lectures. (5F, W, S, Su) Staff

## Physical Science

Administered by the staffs of the Departments of Chemistry; Geology; Physics.

Principles essential to understanding the physical universe. Elements of astronomy, chemistry, geology, and physics integrated for use in interpreting human experiences. Chemistry 31. 3 credits. Geology 31. 3 credits. Physics 31. 4 credits.

## Humanities (Languages and Arts)

English 34, 35, 36—Great Books and Ideas.

English 40, 41—World Literature.

English 53, 54, 58—American Literature.

Philosophy 45—Introduction to Problems of Philosophy.

Philosophy 140, 141, 142—History of Philosophy.

Two years of foreign language are also recommended as an option for satisfaction of the Languages and Arts, or Humanities, group requirement.

## Social Science

History 4, 5, 6—History of Civilization.

Political Science 1—Government and the Individual.

History 13, 14—United States History.

## 192 College of Humanities and Sciences

# Liberal Studies

ASSOCIATE PROFESSOR T. Y. Booth, COORDINATOR.

### Office in Library 306

The program in Liberal Studies has two functions: One is to provide a course of study combining elements of both the humanities and the sciences and leading to a degree in Liberal Studies. Considerable flexibility is afforded through choice among several curricula. 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.

The second 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 opportunities 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.

If you are enrolled in another department but believe that you have chosen your major unwisely you may transfer to the Liberal Studies program upon receiving permission from the Office of Student Services and from the Dean of the College of Humanities and Sciences.

### Curricula in Liberal Studies

The following three courses of study, each leading to a Bachelor's degree, are available in Liberal Studies. You 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 credit hours.

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 hours selected from English 46, 150, 151, 152, 190, 191 and classes in the literature of a foreign language. (2) For the 15-credit requirement: any 15 credits from the above courses.

(B) History. (1) For concentration: History 4, 5, 6; and 25 hours from History 10, 13, 14, 105, 106, 111, 124, 127, 152, and 175. (2) For the 15-credit requirement: History 4, 5, 6.

(C) Philosophy. Fourteen credits from the following: Philosophy 45, 50, 140, 141, 142, 160; Political Science 145, 146, 147.

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<sup>1</sup>See Philosophy Division of Department of Languages. Political Science 145, 146 and 147 deal with political philosophies and are therefore relevant.

(D) Mathematics and science. Complete one of the following series: (1) Biological science: Zoology 3 or Botany 24 or Bacteriology 10; Zoology 107 and 131; Public Health 50. (2) Chemistry: Chemistry 3, 4, 5, or 10, 11, 12. (3) Mathematics: Mathematics 35, 46, 97. (4) Physics: Physics 17, 18, 19 or 20, 21, 22. If you select the series in physics you should fill the exact science group requirement with Mathematics 35 and 46, and are advised to complete Mathematics 97 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, 46, 140, 141, 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>1</sup> Mathematics 35, 46, 97, 98, 99, 110 and either (a) or (b). (a) Chemistry 3, 4, 5 or 10, 11, 12; Physics 17, 18, 19 or 20, 21, 22; 120, 121, 130 or 146, 153, 154 or 175, 176, 177. (b) Physics 17, 18, 19 or 20, 21, 22; Chemistry 3, 4, 5 or 10, 11, 12; 104, 105, 106 or 121, 122, 134.

(2) Biological sciences.<sup>1</sup> Zoology 3, 4, 101, 107, 112, and 131; Botany 24, 25, 30, 118; Bacteriology 10, 160; Public Health 50, 155; Physiology 104. If you select this series you should fill the physical science group requirements with classes in chemistry or physics.

(B) History, literature, philosophy. 30 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.

## Honors Courses

The University sponsors honors courses supervised by a University-wide committee representing the academic deans. Enrollment is limited. You may be admitted on the recommendation of your 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*. Senior Colloquium 1. (2F) Staff

112. *Roots of Modern Educational Thought*. Senior Colloquium 2. (2W) Staff

113. *Far Eastern Thought*. Senior Colloquium 3. (2S) Staff

<sup>1</sup>Ten of these credits may be applied toward the group requirement in the field.



## 194 College of Humanities and Sciences

You are encouraged to broaden your liberal education with other courses in basic sciences and hu-

manities, art, music, landscape architecture, political science, economics, and sociology.

### Department of

## Bacteriology and Public Health

(Bacteriology, Public Health, Medical Technology)

PROFESSORS *W. Whitney Smith*,<sup>1</sup> HEAD, *Lewis W. Jones*, ACTING HEAD, *Kenneth R. Stevens*; ASSISTANT PROFESSORS *Paul B. Carter*, *Reed S. Roberts*.

Office in Plant Industry 310

### Bacteriology and Public Health

*Bachelor of Science Degree.* For a General Bacteriology major you should take: Bacteriology 10 or 70, 71, 104-105 or 120-121, 110, 160, 168, 180, 201, 291; Chemistry 3, 4, 5, 115, 121, 122, 190; Mathematics 35, 44; Physics 17, 18, 19; Public Health 50; Botany 24, 25; Zoology 3, 4, 107, 112, 116.

*For a Public Health major* you should take: Public Health 15, 50, 150, 155, 254; Bacteriology 10 or 70, 71, 160; Physiology 4 or 120; Zoology 3, 112, 116; Entomology 115; Physical Education 55, 135, 145; Psychology 100 or Family Living 100; Psychology 145 or Sociology 162; Foods and Nutrition 5, Chemistry 10, 11, 12.

*For a Health Education major* you should consult H. B. Hunsaker, head of the Department of Health, Physical Education and Recreation.

*For a minor in Health Education* you should take: Public Health 15, 50, 150; Physical Education 135, 145; Food and Nutrition 5; Psychology 145 and Child Development 67.

### Graduate Study

*The Department of Bacteriology and Public Health has good facilities for research and advanced studies.* Available on the third and fourth floors of the Plant Industry building are the usual technical instruments. The department also has access to an electron microscope, ultra centrifuge, electrophoresis apparatus, spectrograph, 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 your course work in bacteriology and related subjects. At the conclusion of the Master's degree you are expected to have completed most of 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). The doctorate in bacteriology is primarily a research de-

<sup>1</sup>On leave.

## Bacteriology 195

gree. A doctoral thesis comprising an intensive and definitive contribution to knowledge is the most basic requirement. In previous training or in the doctoral program you are expected to have course work in bacterial physiology, systematic bacteriology, dairy or food bacteriology, soil or industrial bacteriology, mycology, protozoology, virology. You are expected to have supporting strength, probably as minors or parts of mixed minors in several of the following: algology, biochemistry, physical chemistry, pathology, physiology, histology, entomology, genetics, plant physiology, physics, biophysics, and other science specialties.

You are expected to offer two of the following research tools: applied statistics, a reading knowledge of German, a reading knowledge of French, or suitable substitutes justified by the nature of the doctoral project. These should be completed at least one year before the final examination.

*All candidates for the Ph.D. in bacteriology must have received the equivalent of 40 credits either before or during the doctoral program at some other institution which also offers at least a Master's in Bacteriology.*

## Bacteriology Courses

**1. Principles of Biology.** Basic life principles illustrated in both plant and animal forms. Designed in combination with Bact. 10 or Physiology 4 to meet the University biological science requirements. (5F, W) **Roberts**

**10. Elementary Bacteriology.** Basic concepts, practical applications, demonstrations. Intended primarily for students in non-science fields. (Not open to students who have had Bacteriology 70.) (5F, W, S, Su)

**Jones, Stevens**

**70. General Bacteriology.** For majors in science departments. (Not open to students who have had Bacteriology 10.) Prerequisite: Concurrent or previous registration in organic chemistry (4S) **Jones**

**71. General Bacteriology Laboratory.** Prerequisite: Previous or concurrent registration in Bact. 10 or 70. Two 3-hour labs. (2F, W, S) **Jones, Stevens, Roberts,**

**\*\*104. Dairy Bacteriology.** Micro-organisms of milk and its products. Prerequisite: Bact. 10 or 70. (3S) **Jones**

**\*\*105. Dairy Bacteriology Laboratory.** Two 3-hour labs. Prerequisite: Bact. 71, and previous or concurrent registration in Bact. 104. (2S) **Jones**

**\*110. Soil Microbiology.** Relationships of micro-organisms to soil fertility. Prerequisite: Bact. 10 or 70. (2S) **Jones**

**\*120. Food Microbiology.** Relationships of micro-organisms to food preservation, spoilage, and poisoning. Prerequisite: Bact. 10 or 70. (2S) **Jones**

**\*\*121. Food Microbiology Laboratory.** (2F) **Jones**

**160. Pathogenic Bacteriology.** Properties of pathogens and relationships to infectious diseases. Prerequisite: Bact. 71 and 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. (5S) **Carter**

**168. Immunology.** Prerequisites: Bact. 160 and Biochemistry. Three lectures, two labs. (5W) **Carter**

**\*\*172, 173. Bacteriology Laboratory Methods.** (2W, 2S) **Jones**

**180. Physiology of Bacteria.** Cellular chemistry and physiology. Prerequisites: Bact. 10 or 70, Organic Chemistry. (4W) **Jones**

**\*\*201. Systematic Bacteriology.** Classification relationships. Prerequisite: Bact. 10 or 70. (2S) **Staff**

**291. Seminar.** (1F, W, S) **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, S) **Staff**

**299. Thesis Research.** Credit arranged. (F, W, S) **Staff**

**\*Taught 1961-62.**

**\*\*Taught 1962-63.**

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### Public Health Courses

Public Health courses do not satisfy biological science group requirements.

**15. Personal Health.** Health problems of University students; especially for freshmen and sophomores. (2F, W, S)

Stevens, Members of Cache Valley  
Medical and Dental Associations

**50. Elementary Public Health.** Communicable and non-communicable diseases of general community significance. (3F) **Roberts**

**150. Environmental Sanitation.** Biological Background of Hygiene. Control of: air-, insect-, water-, sewage, rodent-, refuse-, and food-transmitted diseases. Sanitation of housing, campsites, and schools. (4S) **Roberts**

**\*\*151. Public and School Health Administration.** Organization, administration and functions of health agencies. Prerequisite: P.H. 50. (3F) **Staff**

**152. Family Health.** A broad course on the fundamentals of healthful living. For juniors and seniors in Home Economics Education who are required for state of Utah certification to take a course in family health. Does not meet the school health requirement for state of Utah certification. (3) **Roberts**

**154. School Health Program.** Satisfies state certificate requirements in health education for elementary and secondary levels. For juniors, seniors, and graduates. (3F, W, S) **Stevens, Roberts**

**155. Health Education for Teachers.** Health training for state certification requirements in health education. (4F, W, S, Su) **Stevens, Roberts**

**\*\*156. School Health Methods.** Objectives, methods, curricula, and materials. Prerequisite: P.H. 155. (3S)

**159. Public Health Laboratory Methods.** Experience in the practice of the Public Health Laboratory. (3 to 15F, W, S) **Fraser**

**254. Special Problems in Public Health.** Assignments, reports, discussions. Preparation of a comprehensive and critical review. Credit arranged. (F, W, S) **Staff**

### Medical Technology

The College of Humanities and Sciences 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 you for the B.S. degree.

*For a Medical Technology major* you should take during your first three years: Bacteriology 10 or 70, 71, 131, 160, 168; Chemistry 3, 4, 5, 12, 115, 190; Physiology 4; Physics 6; Zoology 3, 116. A hospital internship for twelve months shall be completed during the fourth year, which shall include instruction in Medical Technology 133, 134, 135, 136, 137, 138, 139. Utah State University has provision for instruction of laboratory technicians in this internship in the LDS hospitals in Salt Lake City, Ogden, and Idaho Falls and St. Benedict's hospital in Ogden. During this fourth year, you register for three quarters, (45 upper division credits in Medical Technology.) When this program is satisfactorily completed, you are eligible for the Bachelor of Science degree in Medical Technology. You 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 P. B. Carter for further details.)

### Medical Technology Courses

**131. Clinical Laboratory Methods.** Prerequisite: Bact. 71. (4S) **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, S) **Carter**

**136. General Pathology Discussions.** (2F) **Carter**

**137. Clinical Laboratory Methods Discussion.** (2W) **Carter**

**138. Blood Bank and Blood Serology Techniques.** (1S) **Carter**

**139. Pathological Conference.** (1S) **Carter**

## Department of

# Chemistry

PROFESSORS *Melvin C. Cannon*, HEAD, *Sherwin Maeser*, EMERITUS, *Delbert A. Greenwood*, *Harris O. Van Orden*; ASSOCIATE PROFESSOR *Garth L. Lee*; ASSISTANT PROFESSORS *G. Olof Larson*, *William M. Moore*, *H. M. Nielsen*, *L. Elmer Olson*, *Jack T. Spence*.

### Office in Widtsoe Hall 201

**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 group requirements of the University as given in this catalog, will be certified by the Society. Completion of the schedule below will enable you to meet all these requirements. Each major must attain at least a 2.5 average in chemistry, physics and mathematics courses to qualify for graduation.

**Minor.** A minimum of eight credits of upper division chemistry courses is required for a Chemistry Department approved minor. Suggested courses which will meet these requirements are: Chemistry 101, 115, 121, 122, 190.

**Teaching Major.** A teaching major in chemistry requires the completion of the following minimum program: Chemistry 3, 4, 5, 101, 115, 121, 122 and 190. Supporting courses to be taken are Physics 17, 18, 19 and Mathematics 35, 44, 97, 98, 99. For a composite teaching major in physical science the following minimum schedule is recommended: Chemistry 3, 4, 5, 12 or 121, 101 or 190; Physics 17, 18, 19, 131 or 140; Mathematics 35, 44 or 46, 97, 98, 99. Required professional education courses for the teaching certificate are listed by the College of Education.

**Chemical Engineering.** If you are interested in obtaining a degree in Chemical Engineering you may pursue the first two years of this program at USU. Courses taken under this program will be accepted at other universities giving the degree. The proposed curriculum of study for Chemical Engineering is listed in this catalog under the College of Engineering.

### Graduate Study

All new graduate students must take entrance examinations in inorganic, organic, physical and analytical chemistry. These will be administered three days before registration day in the fall quarter and by special arrangement at other times.

**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. Besides graduate courses (in the 200 series), courses 116, 124, 134, 135, 153, and 190 may be used in filling the requirements for the Master's degree.

Before admission to candidacy for the degree, you will be required to pass examinations in General Chemistry, Qualitative Analysis, Quantitative Analysis, Organic Chemistry and Physical Chemistry.

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### Doctor of Philosophy Degree.

The Chemistry Department offers advanced study and research leading to a degree of Doctor of Philosophy. Before admission to candidacy the student must fulfill the following requirements: (a) Pass a qualifying examination at the normal graduate level in analytical, organic, physical and inorganic chemistry. Ordinarily, this is to be taken before the beginning of the second academic year. (b) Demonstrate a reading comprehension of German and of Russian or French. (c) Pass a *comprehensive* examination in a field of specialization, not later than one academic year before the final examination on the thesis. (d) 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.

A graduate program in *Biochemistry and Nutrition* leading to a Master of Science or a Doctor of Philosophy degree is available in cooperation with departments giving courses in these areas. Detailed information may be found in this catalog under the School of Graduate Studies.

### Curriculum for Chemistry Majors

#### FRESHMAN

Courses	F	W	S
Chemistry 3, 4, 5 .....	5	5	5
Mathematics 35, 46, 97 .....	5	5	5
(or 34, 35, 46).....			
English 1, 2, 3 .....	3	3	3
Military or Air Science or Physical Ed. ....	1	1	1
Electives .....	3	3	3
Total .....	17	17	17

#### SOPHOMORE

Courses	F	W	S
Mathematics 98, 99, 110 .....	5	5	5
(or 97, 98, 99) <sup>1</sup>			
Chemistry 121, 122, 115 .....	5	5	5
Physics 20, 21, 22 .....	5	5	5
Military or Air Science or Physical Ed. ....	1	1	1
Total .....	16	16	16

#### JUNIOR

Courses	F	W	S
Chemistry 190, 123 .....	5	4	4
Chemistry 104, 105, 106 .....	3	3	3
Chemistry 109, 110, 111 .....	1	2	1
German 1, 2, 3 .....	5	5	5
Electives, group requirements.....	3	8	5
Total .....	17	18	18

#### SENIOR

Courses	F	W	S
Physics 122, 130.....	3	3	....
Chemistry 152, 153, 250 .....	3	4	3
Chemistry 160 .....	....	1	....
Chemistry 198, 199 .....	1	1	1
Advanced Physical or Organic.....	3	3	3
Electives, group requirements .....	8	5	10
Total .....	18	17	17

### Chemistry Courses

3, 4, 5. **Chemical Principles and Qualitative Analysis.** 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. Three lectures, two labs. (5F, 5W, 5S) **Staff**

10, 11. **General Chemistry.** Principles of inorganic chemistry. Prerequisites: One unit of high school or college algebra. Four lectures, one lab. (5F, 5W, 5S) **Lee**

12. **Elementary Organic Chemistry.** An introduction to organic chemistry. Designed to follow Chemistry 11 and completes a one-year terminal course in chemistry. (5S) **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, 3S) **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. 12 or 5; Math. 34 or equivalent. Three lectures. (3S) **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. 5, 115; Physics 20, 21, 22; Math. 99. Three lectures. (3F, 3W, 3S) **Staff**

**\*108. Dairy Chemistry.** The chemistry of milk and milk products, including tests for adulterants, preservatives, and routine methods of quantitative analysis of dairy products. Prerequisites: Chem. 12 or equivalent; Chem. 190. (4W) **Van Orden**

**109, 110, 111. Experimental Physical Chemistry.** Laboratory work correlated with Chemistry 104, 105, 106. (1F, 2W, 1S) **Staff**

**115. Quantitative Analysis.** Basic theory and laboratory practice in gravimetric and volumetric analysis. Prerequisites: Chem. 5, Math. 35. Three lectures, two labs. (5S) **Cannon**

**116. Inorganic Preparations.** A laboratory course in practical methods of synthetic inorganic chemistry. Prerequisite: Chem. 5 (Credit arranged) **Lee**

**121, 122. Organic Chemistry.** Fundamentals of the chemistry of carbon compounds. Four lectures, four hours laboratory per week. Prerequisites: Chem. 5. Four lectures, one lab. (5F, 5W). **Larson**

**134. Qualitative Organic Analysis.** The classification, reactions and laboratory work involved in the identification of unknown organic compounds. Prerequisites: Chem. 115, 122. (4S) **Larson**

**124. Organic Preparations.** An advanced laboratory course in the synthesis of complex compounds. Prerequisite: Chem. 122. (3F) **Larson**

**135. Chemical Literature.** Exercises in finding, assembling and using information available in technical publications. (3S) **Staff**

**152. Intermediate Quantitative Analysis.** Theory and laboratory practice of complex formation, non-aqueous systems, precipitate formation, electroanalysis and related topics as applied to quantitative analysis. Prerequisites: Chem. 106, 115. Two lectures, one lab. (3F) **Cannon**

**153. Instrumental Analysis.** Theory and application of physico-chemical methods of analysis. Selected electrochemical and optical methods. Prerequisites: Chem. 106, 115. Three lectures, one lab. (4W) **Cannon**

**155. Glass Blowing.** A laboratory course in the technique of manufacturing and repairing pyrex brand laboratory glassware. (2W) **Staff**

**160. Undergraduate Seminar.** (1W) **Staff**

**190. Elementary Biochemistry.** The chemistry of carbohydrates, fats, proteins, enzymes, vitamins, hormones and minerals, and their transformations in plants and animals. Prerequisite: Chem. 12 or 121. Four lectures, one lab. (5F) **Van Orden**

**198. Undergraduate Research Problems.** Credit arranged. (F, W, S) **Staff**

**199. Undergraduate Thesis.** (1F, 1W, 1S) **Staff**

**215. Advanced Physical Chemistry.** Fundamentals of chemical thermodynamics with application to selected problems. Prerequisite: Chem. 106. Three lectures. (3F) **Staff**

**216. Advanced Physical Chemistry.** Thermodynamics of solutions and introduction to statistical mechanics. Prerequisite: Chem. 215. Three lectures. (3W) **Staff**

**217. Advanced Physical Chemistry.** Chemical kinetics, molecular structure and advanced topics. Prerequisite: Chem. 216. (3S) **Staff**

**218. Quantum Chemistry.** Wave mechanical applications to problems of chemical bonding. Prerequisite: Chem. 216. Three lectures. (3F) **Staff**

**219. Statistical Mechanics.** Classical statistical mechanics, Boltzman distributions, statistical thermodynamics, Fermi Dirac and Bose-Einstein statistics. Prerequisite: Chem. 216. Three lectures. (3W) **Staff**

**225, 226, 227. Advanced Organic Chemistry.** Extended studies in organic chemistry. Prerequisites: Chem. 106, 122. Three lectures. (3F, 3W, 3S) **Larson**

**228, 229. Theoretical Organic Chemistry.** Structure and mechanism in organic chemistry with emphasis on electronic interpretations and kinetics. Three lectures. (3F, 3W) **Staff**

**230. Synthetic Organic Chemistry.** A study of recent methods of organic synthesis. Three lectures. (3S) **Staff**

**231. Heterocyclic Compounds.** (3F) **Staff**



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**232. The Colloidal State and Surface Chemistry.** Application of physical-chemical principles to surface phenomena. Fundamental properties and theories of colloiddally dispersed systems. Examples of colloidal behavior selected from diverse fields. Prerequisites: Chem. 215; Math. 99. Three lectures. (3W) **Staff**

**233. Special Topics in Organic Chemistry.** Three lectures. (3F, 3W, 3S) **Staff**

**250. Advanced Inorganic Chemistry.** A study of the elements and their compounds. Based on the atomic structure. Prerequisite: Chem. 104. Three lectures. (3S) **Lee**

**252. Crystal Chemistry.** An interpretation of chemical and physical properties of crystals. Structural properties derived from X-ray crystallography are emphasized. Prerequisites: Chem. 216; Math. 99. Three lectures. (3S) **Staff**

**253. Advanced Chemical Kinetics and Rate Theory.** Fundamental principles governing reaction rates. Advanced topics. Prerequisites: Chem. 217, 219. Three lectures. (3S) **Staff**

**260. Graduate Seminar.** (1F, 1W, 1S) **Staff**

**272. Advanced Topics in Analytical Chemistry.** Modern development in quantitative analysis, methods of separation, statistical treatment of data, measurement of pH, and other topics. Prerequisites: Chem. 106, 152. Three lectures. (3F) **Staff**

**273. Advanced Instrumental Analysis.** Radiochemical methods, mass spectroscopy, electron microscopy. Prerequisites: Chem. 106, 153. Three lectures. (3S) **Staff**

**274. Advanced Analytical Chemistry.** Special Problems. Credit arranged. (F, W, S) **Staff**

**289. Animal Metabolism.** Feeding experiments involving development of amino acid, vitamin, mineral, and other nutritional deficiencies in animals. Chemical and biological tests made on rations, animal tissues, blood, urine, and other secretions and excretions when indicated. Credit arranged. (F, W, S) **Greenwood**

**290. Toxicology.** The effects of selected chemical compounds on living organisms. Prerequisites: Chem. 190 and 122. Three lectures. (3S) **Greenwood**

**291. Toxicology Laboratory.** Qualitative and quantitative determinations of inorganic and organic poisons. Observations of symptoms which develop upon administration of poisons. To accompany Chem. 290. Two labs. (2S) **Greenwood**

**292. Advanced Biochemistry: Biochemical Analysis.** Problems in metabolism, micro-methods of blood and urine analysis, with their applications to metabolism and to the diagnosis and treatment of disease. Prerequisite: Chem. 190. To accompany or follow Chem. 296. Two labs. (2 or more S) **Greenwood**

**293. Advanced Biochemistry: Biochemical Preparations.** Preparation of enzymes, and amino acids. Prerequisite: Chem. 190. To accompany Chem. 295. Two labs. (2 or more W) **Greenwood**

**294. Advanced Biochemistry: Biological Assays.** Microbiological and colorimetric methods for determination of vitamins and amino acids in plant and animal tissues. Prerequisites: Chem. 190; Bacteriology 70 or 71. To accompany or follow Chem. 297. Two labs. (2 or more F) **Greenwood**

**295. Advanced Biochemistry: Enzymes.** Enzymes and their functions in plants and animals. Prerequisites: Chem. 101, 190. Three lectures. (3W) **Van Orden**

**296. Advanced Biochemistry: Principles of Metabolism.** Carbohydrates, fats and proteins and their metabolism in plants and animals. Prerequisites: Chem. 101; 190. Three lectures. (3S) **Van Orden**

**297. Advanced Biochemistry: Vitamins.** Vitamins and hormones and their functions in plants and animals. Prerequisites: Chem. 190. Three lectures. (3F) **Van Orden**

**Nutrition and Biochemistry Seminar.** (See An. Hus. 270)

**298. Graduate Research.** Credit arranged. (F, W, S) **Staff**

Department of

# English and Journalism

(English, Journalism, Photography)

PROFESSORS *King Hendricks*, HEAD, *Ira N. Hayward*, EMERITUS, *Carlton F. Culmsee*, *Moyle Q. Rice*, *Hubert W. Smith*; ASSOCIATE PROFESSORS *T. Y. Booth*, *Arthur H. Fietzsche*, *John M. Patrick*, *John J. Stewart*, *J. Golden Taylor*; ASSISTANT PROFESSORS *John S. Bullen*, *J. Lynn Mortensen*, *Reed C. Stock*; LECTURER *Veneta L. Nielsen*; INSTRUCTORS *J. R. Allred*, *Arlen L. Hansen*, *Karl W. Klages*.

**English Office in Library 320**

**Journalism Office in Main 182**

**Photography Office in TG Building**

## English

You may take one of three majors in the English Department: (1) the Standard English major; (2) the English teaching major; (3) the American Studies major. In any of these majors, by completing the necessary requirements in Education, you may qualify for a teaching certificate. In two of these majors, the Standard English major and the American Studies major, you may qualify for admission into the Graduate School. With the English teaching major you cannot qualify for graduate work.

*English Major.* A minimum of 15 credits in the lower division course work drawn from American, English, and World Literature; a minimum of 30 credits of upper division course work. Two years or 24 credits of a foreign language.

*English Teaching Major.* English Teaching major is same except for language requirements.

*American Studies Major.* The English department, in cooperation with the College of Business and

Social Sciences, offers a major in American Studies. The requirements are as follows:

(1) A minimum of 36 credits in English, American, and World Literature, drawn from the following or other approved courses: 40, 41, 45, 53, 54, 58, 60, 61, 147, 150, 151, 152, 154, 155, 156, 157, 158.

(2) A minimum of 16 credits in History, drawn from the following or other approved courses: History 13, 14, 156, 175. A minimum of 11 hours of Political Science, drawn from the following or other approved courses: Political Science 10, 117, 118, 119.

(3) A minimum of six credits from courses in the following areas: Economics, Sociology, Art, Music, and Education. The specific courses of these areas to be approved by the major professor.

(4) A minimum of two years of modern foreign language, French, German, or Spanish.

(Students with a major in American Studies are not required to present a minor.)

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*Writing and Mass Communication.* The curriculum in Writing and Mass Communication is designed for you who aspire to enter one of a variety of careers involving writing. The emphases are upon practice in writing under the guidance of skilled writers, study of models of successful writing, acquaintance with the mass media and with the interests and needs of the persons they serve, and a liberal education.

The plan is to provide some writing course or writing experience each quarter. In addition to Basic Communication, you should complete a minimum of 30 credits chosen from the following: English 111, 112, 117a, b, and c, and 199; Journalism 12, 13, 14, 84, 112, 164, 184. Suggested additional courses are Fine Arts—Theatre 160, Speech 81, 125, English 5, 104, 105, Philosophy 45, 50, 140, 141, 142, 160.

You will also complete at least 30 credits chosen from the literature courses offered in English. The 60 required credits include both majors and minor.

You will also complete two years of a foreign language.

*English-Speech Composite Major.* A minimum of 35 credits of course work approved by the head of the English department. (See Speech department for speech requirement.) Courses should be approved by the English advisers—Hendricks for freshmen and sophomores; Smith for juniors and seniors.

*English Teaching Minor.* To obtain the recommendation of the English department, a teaching minor must present a minimum of 25 credits of English course credit; this credit must have the approval of the head of the English department.

Any of the above majors and the completion of the Utah State requirements for certification, provided grades are satisfactory, will qualify you as a secondary teacher in Utah.

As a prospective major or minor you should consult the head of the English department as early in your college career as possible.

*Journalism and Photography Major.* For a major in Journalism and Photography you should complete Journalism 1 through 6, 12, 13, 14, 84, 106, 112, 125, 164, 184; Photography 51, 61, 151, 161; Speech 81, 82, 83, 181. You should also complete English 5, 111, 117 a and b, and at least 20 credits in English and American literature. You are urged to enroll for as many philosophy and history courses as possible.

It is recommended that a minor be selected from the following: Accounting, Art, Business Administration, Economics, History, Language, Political Science, Psychology, Sociology, Social Science, Speech.

A minor may be taken in either Journalism or Photography or in a combination of them. For details of a Photography minor, see Mr. Arlen Hansen, TG Building.

### Graduate Study

*Master of Science Degree.* As a candidate for a Master of Science degree in English you must present a Bachelor's degree with English as a major, or an equivalent. To complete the degree you must (1) take the Graduate Record Examination given by the School of Graduate Studies; (2) pass the English departmental examination; (3) complete 45 credits in course work, of which not more than 15 nor fewer than nine may be thesis credit, and

of which ten credits must be in courses numbered over 200; (4) present from the language department, a statement of your proficiency in the reading of one foreign language; (5) present an acceptable thesis; (6) pass successfully a test on 15 books recommended by the English Department; (7) pass successfully the final oral examination under the auspices of the Graduate School.

*Master of Science in American Studies.* As a candidate for the Master's degree in American Studies you are required to present a Bachelor's degree with American Studies, English, History, or Political Science as a major. Your course of study will be arranged in consultation with any member of the English Department, American Studies committee and is subject to approval by the chairman of the committee, Dr. Hubert W. Smith. The emphasis in your graduate work will be largely governed by (A) your own cultural and professional objectives and (B) your 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.

A selection of the following courses may be applied toward satisfying requirements for the Master's degree in American Studies: English 150, 151, 152, 154, 155, 156, 157, 201, 252 and 253; History 143, 144, 152, 156, 171 and 175; Political Science 125, 127, 140, 160, 180, 182, 201, 207, 208 and 209.

As many as 10 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.

*Assistantships.* Some assistantships are available for students who qualify as Master's candidates in the English department. If you are interested in one of these assistantships you should make formal application to the Head of the English department.

## English Courses

**English for Foreign Students.** (See Languages Department.)

**1, 2, 3. Basic Communication.** Required of all freshmen. Before credit can be obtained for English 1, the instructor must have received your Placement Test Score. (3F, 3W, 3S)

**Staff**

**4. Elements of Grammar.** For students who wish training in grammar beyond that given in Basic Communication. (3F, W, S)

**Mortensen**

**5. Vocabulary.** A study of word formation and derivation as a means of understanding scientific terms and of increasing vocabulary. (3F, W, S)

**Staff**

**12a, 12b. Practice in Composition.** For students who wish to practice in composition beyond that given in Basic Communication. (2F, W, S)

**Staff**

**14, 15, 16.** Required of all foreign students who fail to pass the English Entrance test. The courses are designed to assist the student in mastering the written and spoken forms of the English language. (3F, W, S)

**Staff**

**31. Floating Poetry.** Poetry that has lived in oral tradition since medieval times. (3S)

**Hendricks**

**32. Readings in Poetry.** To develop appreciation for poetry. Verse forms, various types of poems, and the idea underlying lasting poetry. (3W)

**Nielsen**

**33. Readings in Short Story.** (3F, W, S)

**Rice**

**34. Great Books and Ideas.** Man's ideas about himself, the universe, and the divine. (3F)

**Rice, Nielsen**

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35. **Great Books and Ideas.** Man's ideas about social relationships. (3W) **Rice, Nielsen**
36. **Great Books and Ideas.** Man's ideas about the modern world. (3S) **Rice, Nielsen**  
(Courses 34, 35, 36 are related but they are taught as independent units and need not be taken as a series.)
37. **Reading in the Novel.** (3F, W, S) **Bullen**
40. **World Literature Before 1650.** (5F, W, S) **Nielsen**
41. **World Literature from 1660 to the Present.** (5F, W, S) **Nielsen**
42. **Readings in Mythology.** (3W) **Staff**
46. **The Bible as English Literature.** (5S) **Taylor**
48. **Modern European Literature.** (3F) **Staff**
53. **American Literature, Early Period.** (5F, W, S) **Smith, Taylor, Morsberger**
54. **American Literature, Late Period.** (5F, W, S) **Smith, Taylor, Morsberger**
58. **Modern American Literature.** (3F) **Morsberger, Taylor**
60. **English Literature, Early Period.** (5F, W, S) **Staff**
61. **English Literature, Late Period.** (5F, W, S) **Staff**
68. **Modern English Literature.** (3W) **Staff**
104. **Grammar.** Designed for teachers. (3S) **Mortensen**
105. **History of the English Language.** (3S) **Storm**
111. **Technical Writing.** The effective communication of ideas via the technical report and the scientific article. Intended for junior and senior students of engineering, forestry, and the physical and life 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.) (3F, W, S) **Frietzsche, Mortensen**
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. (3F, W, S) **Staff**
117. **Creative Writing**  
(a) Short Stories. (3S) **Rice**  
(b) Essays. (3F) **Rice**  
(c) Poetry. (3W) **Nielsen**
122. **Children's Literature.** Prose and poetry of children to the junior high school age. (3F, W) **Mortensen**
123. **Literature for Adolescents.** Prose and poetry of the high school age. (3S) **Mortensen**
134. **Literary Criticism.** Masterpieces of criticism from Plato and Aristotle to Croce. (4S) **Culmsee**
137. **English Novel.** A study of the English novel in the 18th and 19th centuries. (3S) **Bullen**
140. **Classical Literature.** A study of the literature of Greece. (5F) **Stock**
141. **Roman Literature.** A study of Roman literature in classical period. (5S) **Stock**
147. **Comparative Literature.** The Eighteenth Century in France and England. (3F) **Hendricks**
148. **Comparative Literature.** The Romantic Period in England and Germany. (3W) **Hendricks**
149. **Comparative Literature.** The Nineteenth Century in England and Europe. (3S) **Hendricks**
150. **American Poetry.** From Philip Freneau to the Present. (3F) **Morsberger**
151. **American Fiction.** Nineteenth and early Twentieth Century fiction writers. (3W) **Smith**
152. **American Drama.** Historical treatment of American drama: extensive reading of representative plays. (3S) **Smith**
154. **Major American Authors.** Intensive studies of the chief American novelists, poets, and essayists of the Nineteenth Century: (a) Edgar Allen Poe; (b) Ralph Waldo Emerson; (c) Nathaniel Hawthorne; (d) Herman Melville; (e) Mark Twain; (f) Henry James; (g) Walt Whitman; (h) Thoreau. (i) Faulkner. Taught when required. (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. (3F) **Taylor**
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. (3W) **Taylor**

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. (3S) **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. (3S) **Smith**
162. **Chaucer.** (5F) **Storm**
163. **Shakespeare. Comedies and History Plays.** (5W) **Patrick**
164. **Shakespeare. The Tragedies.** (5S) **Patrick**
165. **Major English Authors.** (a) Donne; (b) Johnson and Boswell; (c) Shelley; (d) Tennyson; (e) Browning; (f) Arnold. Taught when required. (2) **Staff**
166. **Middle English Literature.** A study of English literature from the 12th century to the renaissance. (3F) **Frietzsch**
168. **Readings in World Drama.** (5F) **Booth**
169. **Readings in World Drama.** (5W) **Booth**
170. **Milton.** (3S) **Rice**
175. **Literature of the English Renaissance.** (5W) **Frietzsch**
180. **Restoration and Eighteenth Century.** (5F) **Storm**
190. **The Romantic Period.** (5W) **Patrick**
191. **The Victorian Period.** (5S) **Patrick**
199. **Readings and Conference.** Credit arranged. Any quarter. Students must have the approval of the Head of the department. **Staff**
200. **Thesis.** Credit arranged. (F, W, S) **Staff**
201. **Bibliography and Methods.** Required of all candidates for the Master's degree in English. (3F) **Smith**
202. **A, B, C. Problems in Teaching Freshman English.** A course designed to help the graduate assistants meet the actual classroom problems in Basic Communications. Required of all teaching assistants. (1F, 1W, 1S) **Staff**
209. **Anglo-Saxon.** Required of all candidates for the Master's degree. (5W) **Storm**
211. **Bibliography and Research Methods.** An intensive course in preparation of bibliography, use of source materials, and other problems of thesis writing. Open to graduate

students only; recommended for first quarter of graduate study. (2F, W, S)

**Taylor, Frietzsch**

234. **Seminar in Modern Criticism.** (3F) **Patrick**
252. **Seminar in American Literature.** (3W) **Smith, Culmsee, Taylor**
253. **Seminar in American Literature.** (3S) **Smith, Culmsee, Taylor**
261. **Reading of Middle English.** (3F) **Hendricks, Storm**
275. **Seminar in English Literature 1580-1685.** (3W) **Frietzsch**
280. **Seminar in Eighteenth Century Literature.** (3W) **Hendricks, Storm**
290. **Seminar in Nineteenth Century Literature.** (3F) **Booth**
299. **Independent Study.** Independent study with credit arranged. Open only to graduate students in English. (1-5F, W, S) **Staff**

## Journalism Courses

1, 2, 3. **College Journalism.** For members of "Student Life" Staff. Discussions of newspaper and responsibilities of journalists.

(1F, 1W, 1S) **Stewart**

4, 5, 6. **College Journalism.** Second year. (1F, 1W, 1S) **Allred**

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. (3F) **Stewart**

13. **Reporting.** Continuation of 12 with emphasis on newspaper style, social responsibilities, and problems of reporting. Practical experience writing for newspapers. Prerequisite: Journ. 12. (5W) **Klages**

14. **Reporting and Copyediting.** Advanced reporting assignments. Laboratory exercises in editing copy, writing headlines, makeup, Prerequisites: Journ. 12, 13. (5S) **Allred**

\*\*84. **Writing for Radio.** Taken concurrently with Speech 83. (3S) **Stewart**

\*91. **Weekly Newspaper.** Problems of editing and publishing weeklies. Efforts are made to provide laboratory experience in a weekly. (3W) **Stewart**

92. **Weekly Newspaper Internship.** Six or more weeks' work in the summer on a weekly newspaper. Prerequisite: Journ. 91. (Time and credit arranged.) (Su) **Staff**

106. **American Mass Media and Propaganda.** Development of American publications and electronic means of disseminating informa-

\*Taught 1961-62.

\*\*Taught 1962-63.



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tion and propaganda; also, main currents in thought conveyed by these media. (5S)

Culmsee

**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. (3W)

Klages

**\*\*125. Editorial Responsibility.** Editorials and other elements of the modern editorial page, writing of editorials; essentials of press law and ethics. (5F)

Culmsee

**\*\*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: Journ. 12, 13, 14 or permission of instructor. (3S)

Allred

**166. Journalism Practices.** Laboratory work in publications, radio or television. (2F, 2W, 2S)

Staff

**\*184. TV Writing.** Writing and editing news, drama and other television material. To be studied concurrently with Speech 181. (3F)

Stewart

**185, 186, 187. Special Problems in Journalism.** (1 to 2F, 1 to 2W, 1 to 2S)

Culmsee

**\*191. School Publications.** For the prospective teacher. Problems of advising staffs of school newspapers, yearbooks and magazines. (3S)

Staff

### Photography Courses

**51. General Photography.** Training in selection and use of cameras, lenses, meters, films,

\*Taught 1961-62.

\*\*Taught 1962-63.

filters, lights, developers, and accessories. Two lectures, one three-hour lab. (3F, W, S)

Hansen

**61. General Photography Laboratory.** Additional lab work to supplement Photography 51 for those desiring more than three credits of work. Two three-hour labs. (2F, W, S)

Hansen

**151. Photographic Problems.** Designed to help solve advanced photographic problems. May be repeated provided that a different type of photographic work is taken each time you register. Repeating students must have approval of major professor and department head. Prerequisite: Photo. 51. Two lectures, lab arranged. Credit arranged. Maximum of 6 credits per quarter. (F, W, S)

Hansen

**161. Advanced Photography Lab.** (2F, W, S)

**163. Commercial and Scenic Photography.** All types of outdoor photography, including scenic, agricultural, livestock, wildlife, and plant life. Suited to students in Forest, Range and Wildlife Management and Agriculture. Prerequisite: Photo. 51. Two lectures, one three-hour lab. (3S)

Hansen

**165. Portrait Photography.** Portrait and group photography. Model directing, lighting, posing, head and shoulder, three quarter, full length, fashion, and group photography. Emphasis on child and home portraiture. Prerequisite: Photo. 51. Two lectures, one three-hour lab. (3W)

Hansen

**166. Color Photography.** Problems in color. Ektachrome, Anscochrome, and Ektacolor; use of tungsten, daylight and flash technique; printing processes; composition in color arrangement. Prerequisite: Photo. 51. Two lectures, one three-hour lab. (3F)

Hansen

## Department of

# Geology

PROFESSOR *J. Stewart Williams*, HEAD; ASSOCIATE PROFESSOR *Clyde T. Hardy*; ASSISTANT PROFESSOR *Donald R. Olsen*.

Office in Main 286

*Bachelor of Science Degree.* For a major in Geology you must satisfactorily complete the following basic courses, Chemistry 10, 11; Civil Engineering 81; Mechanical Engineering 21, 22; English 111; Geology 3, 4, 5, 101, 102, 106, 108, 110, 111, 113, 114, 115, 118; Mathematics 35, 46; Physics 17, 18, 19; and Zoology 3. Recommended are Mathematics 97, 98, 99; Civil Engineering 84, 181; German 1, 2, 3; Photography 51; Chemistry 5, 12; and Physics 20, 21, 22.

*Geology Club:* The Geology Club, under general supervision of the department, is an organization for all geology majors. Regular attendance is required.

*Field Trips:* Majors should reserve Saturdays during Fall and Spring quarters for field trips.

## 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, S) **Hardy**
3. **Physical Geology.** For students in Geology, Forestry, Engineering, Agronomy, or other sciences. (5F, W, S) **Olsen**
4. **Historical Geology.** Physical history of the earth and the development of life as indicated by the geologic record. (5F, W, S) **Hardy**

5. **Minerals and Rocks.** Identification of common minerals and rocks. Prerequisite: Geology 3. (3S) **Olsen**

31. **Physical Science.** Elements of geology integrated with astronomy, chemistry, mathematics, and physics for use in interpreting human experience. Designed to help satisfy physical science group requirement. (3F, W) **Olsen**

101. **Mineralogy.** Identification of minerals by physical and chemical tests. Elementary crystallography. Prerequisites: Geology 3 and Chem. 10, 11. (5F) **Olsen**

102. **Optical Mineralogy and Petrography.** Determination of minerals by using the petrographic microscope. Classification of igneous rocks. Prerequisites: Geology 101 and Physics 19. (5W) **Olsen**

103. **Engineering Geology.** Application of geology to engineering problems. For seniors in Engineering. (3S) **Williams**

106. **Invertebrate Paleontology.** Introduction to the study of invertebrate fossils. Methods of preparation. Prerequisites: Geology 4 and Zoology 3. (5S) **Williams**

108. **Stratigraphy and Sedimentation.** Prerequisite: Geology 3. (5W) **Hardy**

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. (5S) **Hardy**

113. **Economic Geology.** Geologic occurrence of metallic and non-metallic mineral deposits. Prerequisites: Geology 101, 110. (5S) **Olsen**

114. **Geologic Field Methods.** Preparation of geologic and topographic maps utilizing the plane table. Measurement of stratigraphic sections. Survey of geophysical techniques. Prerequisites: Geology 3 and Civil Engineering 81. (5S) **Hardy**

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115. **Advanced Physical Geology.** Processes of erosion. Action and development of streams. Land forms. Subsurface water. Prerequisites: Geology 3, college mathematics, chemistry, and physics. (5F) **Williams**

116. **Special Problems.** Directed study of selected problems. Written report required. (1 to 6F, W, S) **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**

210. **Graduate Seminar.** (2 to 5F, W, S) **Staff**

212. **Stratigraphic Paleontology.** (3F) **Williams**

213. **Paleozoic Stratigraphy.** (3W) **Williams**

214. **Mesozoic and Cenozoic Stratigraphy.** (3S) **Hardy**

215. **Regional Tectonics.** (3W) **Hardy**

216. **Petrography.** (3S) **Olsen**

217. **Petrogenesis.** (3F) **Olsen**

220. **Thesis.** (5 to 15F, W, S) **Staff**

### Department of

## Landscape Architecture and Environmental Planning

PROFESSOR *Laval S. Morris*, HEAD; INSTRUCTOR *A. Craig Tocher*.

### Office in Main 7

Landscape Architecture and Environmental Planning is concerned with the arrangement of land and the objects man places on it for use. The physical plan, including rural areas as well as urban, is made a consideration of design. Functional qualities of a plan are given first consideration and the aesthetic qualities furnished by nature and added by man are integrated by design. Projects range from individual home grounds to complete cities.

*Bachelor of Science Degree.* For a Bachelor of Science degree with a major in Landscape Architecture and Environmental Planning, you should take the following courses which provide: (1) Necessary instructional material directly concerned with Landscape Architecture and Environmental Planning; (2) Supporting courses listed in fields which are closely related, such as

Civil Engineering, Visual Arts, Horticulture, and Botany; (3) Courses required for a liberal education.

#### FRESHMAN YEAR

Course	Cr.
Elem. of Land Planning, L.A. 3 .....	3
Graphics, L.A. 20 .....	3
History and Lit. of Physical Plans, L.A. 30 .....	5
Theory of Design, L.A. 35 .....	3
Algebra, Math. 34, 35 .....	8
Trigonometry, Math. 46 .....	5
General Botany, Botany 24, 30 .....	10
English 1, 2, 3 .....	9
Visual Arts 5 .....	3
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#### SOPHOMORE YEAR

Course	Cr.
Plant Materials, L.A. 40, 41, 42 .....	9
Architectural Design 60, 61, 62 .....	6
Physical Science 31, 32, 33 .....	9
Engineering Graphics, M.E. 21 .....	3
Plane Surveying, C.E. 81, 82 .....	6
Engineering Drawing 94 .....	3
Sociology 70 .....	5
Soils, Agronomy 56 .....	4
Prin. & Prac. Floriculture, Hort. 10 .....	3
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## Landscape Architecture 209

### JUNIOR YEAR

Course	Cr.
Design, L.A. 140, 141, 142 .....	9
Planting Design, L.A. 150, 151, 152.....	6
Recreational Planning, L.A. 130 .....	2
City and Regional Planning 170 .....	3
Fundamentals of Speech, Sp. 1 .....	5
Visual Arts .....	6
English Composition .....	4
Economics 51, or Agr. Econ. 53 .....	5
Electives .....	6

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### SENIOR YEAR

Course	Cr.
Constr., 160, 161, 162 .....	9
Advanced Planning and Design, L.A. 180, 181, 182 .....	9
Sculpturing, Art 160 .....	3
Planning and Design 190 .....	6
Seminar 195 .....	1
Writing Feature Articles, Journalism 112....	3
Roads and Pavements, C.E. 120 .....	4
Electives .....	11

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## LA&EP Courses

**3. Elements of Land Planning and Design.** Relation of people to land regions and small areas. Principles of design and composition applied to various types of land planning. Design of home grounds is emphasized. Field trip required. (3F, S) **Morris**

**20. Graphics.** Methods in instrumental drafting and perspectives, light and shade studies, architectural lettering, and general symbolic graphics necessary in professional practice. (3F, W) **Tocher**

**30. History and Literature.** The history of physical plans as related to the community and its parts. Design and planning in relation to land during the past 5,000 years. Emphasizes present age with implications of the future. (5W) **Morris**

**35. Theory of Design.** Form in relation to vertical mass and horizontal space. Abstract design is studied and the resultant forms transposed into concrete space and mass relationships. The chief purpose is to provide you with an awareness of design as early as possible in your training. (3S) **Tocher**

**40, 41. Plant Materials.** The ecological, functional and aesthetic uses of native and cultivated woody and herbaceous plants for use on the land. Prerequisites: Botany 24, 30. (3F, 3W, 3S) **Tocher**

**60, 61, 62. Architectural Design.** The design, construction, and orientation of architectural structures as related to land areas. Prerequisites: L.A. 20, 35. (2F, 2W, 2S) **Staff**

**130. Park and Recreational Planning.** Analysis and development procedures in national, state, urban parks, forest lands, and private lands in terms of recreational and aesthetic values and uses. Field trip required. (2S) **Staff**

**135. Travel Course.** A major field trip to examine a variety of projects in planning and design. You are required to take this course at least twice during your training. Credit arranged. (Su) **Staff**

**140, 141, 142. Design.** Introduction to the analysis and writing of design criteria and the design of private and public land areas. Theoretical and actual site problems are used. Prerequisites: L.A. 62 and C.E. 82. (3F, 3W, 3S) **Staff**

**150, 151, 152. Planting Design.** Pictorial compositions and planting plans developed together. Designed to develop your ability to visualize the finished landscape. (2F, 2W, 2S) **Morris**

**160, 161, 162. Construction.** Master construction plans, grading, drainage, sprinkling systems, structures, cost estimates and specifications. (3F, 3W, 3S) **Morris**

**170. City and Regional Planning.** An introduction to the scope and methods of city and regional planning. Legislative, administrative, and effectuation of the general interim plan. The physical aspects of town and city are further pursued in all design classes. (3W) **Tocher**

**180, 181, 182. Advanced Planning and Design.** Design of subdivisions, housing projects, public grounds, parks, cemeteries, building groups and recreational areas on various types of topography. (4F 4W, 4S) **Morris**

**190. Special Problems.** Selected problems to meet your individual needs in completing your training. Registration by permission only. Time and credit arranged. (F, W, S) **Staff**

**195. Seminar.** Readings and reports on current topics and trends in Landscape Architecture. Required of senior students. (1W) **Morris**

**210. Advanced Problems in Design and Planning.** Time and credit arranged. (F, W, S) **Staff**

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### Department of

# Languages

## (Languages and Philosophy)

PROFESSOR *George A. Meyer*, EMERITUS; ASSOCIATE PROFESSORS *Austin E. Fife*, *Thelma Fogelberg*; ASSISTANT PROFESSORS *John M. Beyers*, *Gordon E. Porter*<sup>1</sup>, *L. Grant Reese*; INSTRUCTORS *Rolf Ekmanis*<sup>1</sup>, *Hans Mussler*, *Beata Waller*.

### Office in Main 360-A

*Languages.* Elementary language courses train you in the basic grammatical structure of the foreign language and develop your ability to read the language. To the greatest possible extent Utah State University is developing the aural-oral approach in teaching foreign languages both on the elementary and on the intermediate level.

No credit in an elementary language course may be used toward graduation until at least 15 credits have been accumulated.

*Bachelor of Science Degree.* The Department of Languages offers a Bachelor of Science degree with a major in French, German or Spanish. In each case the student must complete at least 30 hours of approved upper division work in his major language. In addition he must complete at least one year of work in a second foreign language.

*Note:* Students who have had two years of high school study in a foreign language may not receive credit for the elementary course in the same language. Students who have had four years of a language in high school may not receive credit for the intermediate course in the same language.

*Teaching minor in a Language:* In order to obtain a recommendation of the Department of Languages, the candidate for teaching minor in French, German or Span-

ish must complete 15 hours of approved upper division work in the language of his choice. This must include the course. *Applied Linguistics for Teacher Candidates.*

*Language credit by special examination.* Students who have acquired a working knowledge of a foreign language by residence abroad may obtain a maximum of 15 hours of lower-division credit in that language by special examination. Students desiring such credit must, however, first complete successfully at least one upper-division course in the language if such a course is available. Credit for foreign languages not taught at Utah State will be granted by special examination only in cases where the department has an instructor competent to examine in that language. At present, examinations may be taken in French, German, Spanish, Portuguese, Russian, Danish, Norwegian, Swedish, and Dutch.

In addition to the elementary courses listed below, permissible special examination credit would be listed, for example, as Norwegian 1, 2, 3. The same numbers would be used in connection with such other languages as are approved by the department and in which qualified personnel are available to conduct the examination.

<sup>1</sup>On leave.

# Language Courses

## French

### LOWER DIVISION

1, 2, 3. **Elementary French.** (5F, 5W, 5S) **Staff**

4, 5, 6. **Intermediate French.** (3F, 3W, 3S).  
Aural-oral approach with knowledge of structure developed through pattern drills, conversation and composition. **Staff**

4a, 5a, 6a. **Intermediate French Readings.**  
Cultural and literary readings with appropriate conversational drills and composition. (2F, 2W, 2S). **Staff**

### UPPER DIVISION

101, 102. **French for Graduate Students.** (2 Summer, 2 Summer). **Staff**

104. **Advanced Grammar and Composition.** (3F) **Fogelberg**

106, 107, 108. **Readings & Conference.** Readings in scientific, technical or literary French. Students must secure approval of the instructor prior to registration. (2F, 2W, 2S). **Fogelberg, Fife**

113. **Applied Linguistics for Teacher Candidates.** Phonology, linguistic analysis and principles of language learning as applied to French. (3F) **Fife**

132. **French Literature, 1850 to 1950.** Realism, naturalism, symbolism, existentialism, poetry, novels, short stories, and the theater. (3W). **Fife**

133. **Romanticism in France.** Chateaubriand, Hugo, Vigny, Musset, Lamartine. (2F) **Staff**

134. **The 18th Century.** Montesquieu, Voltaire, Diderot, Rousseau, Bernardin de Saint-Pierre, Prevost. (2W) **Staff**

138. **The 18th Century.** Comedies of Beaumarchais and Marivaux. (2F) **Staff**

139. **The Comedies of Moliere.** (3F) **Staff**

140. **The Classical Tragedy.** Corneille and Racine. (3S) **Staff**

141. **Philosophers, Moralists and Critics of the Classical Age.** Descartes, Pascal, Boileau, La Fontaine. (2S) **Staff**

142. **French Literature of the 16th Century.** Rabelais, Ronsard, Montaigne. (2W) **Staff**

143. **French Literature in the Middle Ages.** Lyric, epic, and didactic literature; the theater and romances; introduction to Old French. (2S) **Staff**

## German

### LOWER DIVISION

1, 2, 3. **Elementary German.** (5F, 5W, 5S) **Beyers, Staff**

4, 5, 6. **Intermediate German.** (3F, 3W, 3S) **Nielsen**

4a, 5a, 6a. **Second-Year Conversation.** Accompanies German 4, 5 and 6. Work will be largely in the language laboratory. Required of German majors, recommended for all students in Second-year German. (2F, 2W, 2S) **Staff**

7. **Scientific German.** An introduction to the reading of technical German. Readings in German in various scientific fields. Prerequisite German 4 and 5. May replace German 6 for science majors. (3S) (Taught only on sufficient demand) **Beyers**

### UPPER DIVISION

\*105. **Advanced Composition and Conversation.** (3) **Staff**

106, 107, 108. **Readings and Conference.** Readings and reports in various subjects, scientific or literary. Prerequisite: German 5 or equivalent. (1 to 2F, 1 to 2W, 1 to 2S) **Staff**

112. **Applied Linguistics for Teacher Candidates.** Phonology, linguistic analysis and principles of language learning as applied to German. (3F) **Staff**

\*120. **Die deutsche Novelle im 19. Jahrhundert.** Reading and discussion of representative stories by Hauff, Storm, Meyer, Keller and others. (3F) **Staff**

\*\*121. **Lessing-Plays and Biography.** (3) **Mussler**

\*\*122. **Schiller-Poetry, Plays and Biography.** (3S) **Mussler**

\*123. **Die deutsche Novelle im 20. Jahrhundert.** Representative stories by Thomas Mann, Hermann Hesse, Arthur Schnitzler and others. (3W) **Staff**

\*125. **Survey of German Literature. The Middle Ages.** (3F) **Mussler**

\*126. **Survey of German Literature. The 18th Century.** (3W) **Beyers**

\*127. **Survey of German Literature. The 19th Century.** (3S) **Staff**

\*\*129. **Goethe's Dramen.** A study of Goethe's dramas other than Faust—Goetz von Berlichingen, Egmont, Tasso, and Iphigenie. (3) **Staff**

\*\*130. **Goethe's Faust.** Prerequisite: Two years of College German or equivalent. (3W) **Staff**



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**\*\*131. Goethe's Prose.** *Werther*, *Dichtung und Wahrheit*, and selections from Wilhelm Meister. Reading of a biography of Goethe. (3S)  
Staff

**\*133. German Drama of the Nineteenth Century.** Rapid reading and discussion of representative plays from Kleist to Hauptmann. (3W)  
Staff

**\*\*134. German Lyric Poetry.** A study of the major poets of Germany from the earliest times to the present. (3)  
Staff

**150. Modern German Authors.** (A) Thomas Mann. (B) Gerhart Hauptmann. (C) Hermann Hesse. (D) R. M. Rilke. (E) Franz Kafka. (2)  
Beyers

### Greek

**1, 2, 3. Elementary Greek.** (5F, 5W, 5S)  
(Taught only on sufficient demand.) Meyer

### Latin

**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. (5F, 5W, 5S) (Taught only on sufficient demand.)  
Staff

**4, 5, 6. Intermediate Latin.** Readings from the orations of Cicero and Vergil'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. (3F, 3W, 3S) (Taught only on sufficient demand.)  
Staff

**106, 107, 108. Readings and Conference.** (2F, 2W, 2S)  
Staff

### Portuguese

**1, 2, 3. Elementary Portuguese.** Grammar, dictation, conversation and reading. (5F, 5W, 3S) (Taught only on sufficient demand.)  
Porter

**4, 5, 6. Intermediate Portuguese.** Grammar, reading, conversation, composition. (3F, 3W, 3S) (Taught only on sufficient demand.)  
Porter

**106, 107, 108. Readings and Conference.** (1 to 2F, 1 to 2W, 1 to 2S) (Taught only on sufficient demand.)  
Porter

### Russian

**1, 2, 3. Elementary Russian.** (5F, 5W, 5S)  
Ekmanis

**4, 5, 6. Intermediate Russian.** Second-year reading and grammar review. (3F, 3W, 3S)  
Ekmanis

**4a, 5a, 6a. Second-Year Conversation.** Accompanies Russian 4, 5 and 6. Work will be largely in the language laboratory. Required for a Teaching Minor in Russian, recommended for all students in Second-year Russian. (2F, 2W, 2S)  
Ekmanis

### Spanish

#### LOWER DIVISION

**1, 2, 3. Elementary Spanish.** (5F, 5W, 5S)  
Staff

**4, 5, 6. Intermediate Spanish.** (3F, 3W, 3S)  
Fogelberg

**4a, 5a, 6a. Second-Year Conversation.** Accompanies Spanish 4, 5 and 6. Work will be largely in the language laboratory. Required for Spanish majors and strongly advised for all teaching minors. (2F, 2W, 2S)  
Porter

#### UPPER DIVISION

**\*\*105. Advanced Composition and Conversation.** (3W)  
Fogelberg

**106, 107, 108. Readings and Conference.** Readings and reports in various subjects, scientific or literary. Open only to students who have had Spanish 6 or equivalent. (1 to 2F, 1 to 2W, 1 to 2S)  
Porter

**112. Applied Linguistics for Teacher Candidates.** Phonology, linguistic analysis and principles of language learning as applied to Spanish. (3F)  
Fogelberg

**\*\*120, 121, 122. Spanish-American Literature.** The major literary periods and major writers of the Spanish-American countries, from the earliest times to the present. (2F, 2W, 2S)  
Reese

**\*125. Survey of Spanish Literature.** The early literature and the writers of the *Siglo de Oro*. (3F)  
Fogelberg

**\*126. Survey of Spanish Literature.** From the *Siglo de Oro* to the later 19th Century. (3W)  
Fogelberg

**\*127. Survey of Spanish Literature.** The later 19th Century and the 20th Century. (3S)  
Fogelberg

**\*128. Spanish Poetry.** A study of Spanish poetry of the 19th Century. (3F)  
Staff

**\*129. Cervantes.** Reading and analysis of *Don Quixote* and other works of Cervantes. (3W)  
Staff

\*Taught 1961-62.

\*\*Taught 1962-63.

\*130. **The Literature of the Siglo de Oro.** A study of the writers of the Siglo de Oro: Lope de Vega, Tirso de Molina, and Calderon de la Barca. (3S) **Staff**

## Courses for Foreign Students

30. **English Phonetics for Foreign Students.** To train you in the sounds of English, and to increase your ability to speak with the rhythm and intonation of American English. May be taken in conjunction with L. 31. (3F) **Meyer**

31. **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) **Meyer**

32. **English for Foreign Students.** Advanced Grammar. (3W) **Meyer**

## Philosophy

Before registering for upper division Philosophy listed below you should already have completed ten credits in related subjects in the Humanities: Literature, History, Political Science, or Sociology.

### 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. (5S) **Hayward**

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) **Beyers**

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) **Beyers**

141. **History of Early Modern Philosophy.** European thought from the Renaissance through the 18th 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, Leibniz, Locke, Berkeley, Hume, and Kant. (3W) **Beyers**

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. (3S) **Beyers**

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. (3S) **Beyers**

### Philosophical Literature

The following courses have been gathered from various departments. The major part of their content is philosophical. They are assembled here for the convenience of students interested in the interpretations which philosophers and scientists have made of man and his place in the universe. They afford opportunities for both teacher and student to apply philosophical principles to the solution of problems in various fields of human thought and action.

*In many other courses in History, Political Science, and Literature, the philosophical content is rich. Such courses as Ancient World Civilizations and Modern World Civilizations (History 4 and 5) are invaluable to one wishing to understand the development of human thought.*

It is recommended that you take advantage of the instruction in religious philosophy offered by churches in Logan. Of such courses, those classed as non-sectarian yield University credit.

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### Philosophical Literature Courses

34, 35, 36. **Great Books and Ideas.** (See English Department)

**English 46. The Bible as English Literature.** (See English Department)

**English 48. Modern European Literature.** (See English Department)

**English 58. Modern American Literature.** (See English Department)

**English 68. Modern English Literature.** (See English Department)

**Zoology 107. History of Biology.** Important men and ideas in the historical development of biology. (4F) **Gardner**

**Political Science 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. Emphasizes ideas significant in shaping the form and actions of American government today. You may register for one, two, or three quarters. (2F, 2W, 2S) **Harmon**

**Zoology 131. Organic Evolution.** Critical study of the facts of evolution as obtained from consideration of comparative anatomy, embryology, geographical distribution, blood tests, and other factors upon which the doctrine of evolution is based. Factors causing evolution are considered and discussions undertaken on other bodies of related thought. Prerequisite: Zoology 1 or 2, or 3 and 4. (3W) **Gardner**

**English 134. Literary Criticism.** (See English Department) **Staff**

**Political Science 145, 146, 147. History of Political Thought.** No. 145 covers political thought from its beginnings in the Greek period to Machiavelli. No. 146 continues the study from Jean Bodin to Bentham. No. 147 emphasizes the modern period and gives consideration to democratic, fascist, and communist theories. (3F, 3W, 3S) **Harmon**

**English 147, 148, 149. Comparative Literature.** (See English Department)

**History 175. History of American Democratic Thought.** From the Revolutionary War to the present. (3W) **Ricks**

### Department of

## Mathematics

### (Mathematics and Mathematical Statistics)

PROFESSORS *Neville C. Hunsaker*, HEAD, *Joe Elich*; ASSOCIATE PROFESSORS *Charles H. Cunkle*, *Mary Nelson*; ASSISTANT PROFESSORS *C. John Gerriets*, *Robert G. Hammond*, *Wendell Pope*, *Wayne R. Rich*.

### Office in Engineering and Physical Science

Two majors are offered by the Mathematics Department, for the Bachelor of Science degree. If you intend to enter graduate study in mathematics, or intend to teach Mathematics in a junior college or a university, or expect industrial employment as mathematician you should take the regular major. If you intend to teach Mathematics in the secondary schools you may elect to fill the requirements for a teaching major.

As a regular major you are required to complete Mathematics 110, 130, 131, 132, and fifteen additional credits of upper division mathematics selected from courses other than 150, 151 and 152. Physics 20, 21, and 22 are required and 9 credits of upper division physics are recommended. If you expect to obtain a degree higher than a B.S. degree in Mathematics you should have a reading knowledge of French, German, or Russian.

A department-approved teaching major must include Mathematics 99, 150, 151, 152 and at least two other upper division mathematics courses.

A department-approved teaching minor must include Mathematics 98 and 150.

All students majoring in mathematics must have had Plane and Solid Geometry. Plane Geometry is a prerequisite for all university mathematics except Mathematics 20, 34, 35, and 60.

If you complete both Mathematics 24 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.

## Mathematics Courses

**H.S. 42. Plane Geometry.** (F, W; no credit)  
Staff

**20. Elementary Mathematical Concepts.** For prospective teachers in the elementary schools.  
(5F, W, S) Staff

**24. General Freshman Mathematics.** A terminal course for students who are not specializing in mathematics, engineering, or the physical sciences. Prerequisite: A year of high school algebra and plane geometry. (3F)  
Staff

**25. General Freshman Mathematics.** Prerequisite: 24. (3W)  
Staff

**26. General Freshman Mathematics.** Prerequisite: 25. (3S)  
Staff

**33. Solid Geometry.** Prerequisite: Math. 34 or equivalent. (2S)  
Staff

**34. Introduction to College Algebra.** Prerequisite: One year of high school algebra. It is recommended that students with more than one year of high school algebra register for Math. 35. Daily. (3F, W, S)  
Staff

**35. College Algebra.** Prerequisite: 34.  
(5F, W, S) Staff

**44. Plane Trigonometry.** Prerequisite: 35. (3S)  
Staff

**46. Plane Trigonometry.** Prerequisite: 35.  
(5F, W, S) Staff

**50. Descriptive Astronomy.** (3S) Staff

**60. Mathematics of Finance.** (3S) Staff

**97. Analytic Geometry and Calculus.** Prerequisite: 44 or 46. (5F, W, S) Staff

**98. Analytic Geometry and Calculus.** Prerequisite: 97. (5F, W, S) Staff

**99. Integral Calculus.** Prerequisite: 98.  
(5F, W, S) Staff

**110. Calculus and Differential Equations.** Prerequisite: 99. (5F, W, S) Staff

**116. Modern Algebra.** Prerequisite: 99. (3F) Staff

**117. Modern Algebra.** Prerequisite: 116. (3W) Staff

**118. Modern Algebra.** Prerequisite: 117. (3S) Staff

**119. Theory of Equations.** Prerequisite: 99. (3W) Staff

**120. Modern Geometry.** Prerequisite: 99. (3) Staff

**122. Ordinary Differential Equations.** Prerequisite: 110. (3) Staff

**123. Number Theory.** Prerequisite: 99. (3) Staff

**124. Foundations of Mathematics.** Prerequisite: 99. (3) Staff

**126. Numerical Calculus.** Prerequisite: 99. (3F) Staff

**127. Numerical Calculus.** Prerequisite: 126. (3W) Staff

**128. Numerical Calculus.** Prerequisite: 127. (3S) Staff

**130. Advanced Calculus.** Prerequisite: 110. (3F) Staff

**131. Advanced Calculus.** Prerequisite: 130. (3W) Staff

**132. Advanced Calculus.** Prerequisite: 131. (3S) Staff

**140. Advanced Engineering Mathematics.** Prerequisite: Math. 110. (3F) Staff

**141. Advanced Engineering Mathematics.** Prerequisite: Math. 140. (3W) Staff

**142. Advanced Engineering Mathematics.** Prerequisite: Math. 141. (3S) Staff

**145. Vector Analysis.** Prerequisite: 99. (3) Staff

**150. Mathematics for Secondary School Teachers.** Prerequisite: Math. 98. (3F) Staff

**151. Mathematics for Secondary School Teachers.** Prerequisite: Math. 150. (3W) Staff

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**152. Mathematics for Secondary School Teachers.** Prerequisite: Math. 151. (3S) Staff

**153. Mathematical Readings.** Prerequisite: 99. (3) Staff

**160. Determinant and Matrix Theory.** Prerequisite: 99. (3) Staff

**234. Topology.** Prerequisite: 132. (3F) Staff

**235. Topology.** Prerequisite: 234. (3W) Staff

**236. Topology.** Prerequisite: 235. (3S) Staff

**246. Tensor Analysis.** Prerequisite: 145. (3) Staff

**250. Graduate Seminar.** (1F, 1W, 1S) Staff

**251. Real Variables.** Prerequisite: 132. (3F) Staff

**252. Real Variables.** Prerequisite: 251. (3W) Staff

**253. Real Variables.** Prerequisite: 252. (3S) Staff

**254. Theory of Function.** Prerequisite: 132. (3F) Staff

**255. Theory of Functions.** Prerequisite: 254. (3W) Staff

**256. Theory of Functions.** Prerequisite: 255. (3S) Staff

**257. Advanced Applied Mathematics.** Prerequisite: 132. (3) Staff

**258. Advanced Applied Mathematics.** Prerequisite: 257 (3) Staff

**259. Advanced Applied Mathematics.** Prerequisite: 258 (3) Staff

**260. Graduate Thesis.** Time and credit arranged. (F, W, S) Staff

## Mathematical Statistics

*You can get a Bachelor of Science in Mathematical Statistics.* The work in Mathematical Statistics has a three-fold purpose: (a) To train professional statisticians. (b) To instruct students who wish to broaden their mathematical studies or who seek a mathematical background for studies in economics, sociology, genetics, biometry, psychology and education. (c) 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 you wish to major or minor in statistics, take the courses 160 to 167 inclusive in Statistics, plus Mathematics 110, 130, 131, and 132.

## Statistics Courses

**161. Calculus of Probability.** Prerequisite: 99. (5F) Staff

**162. Mathematics of Statistics.** Prerequisite: 99 and 161. (5W) Staff

**163. Mathematics of Statistics.** Prerequisite: 162. (5S) Staff

**\*166. Sequential Analysis and Control of Quality of Output in Manufacturing.** (3S) Staff

**\*167. Statistical Reading and Reports.** (3S) Staff

\*Taught 1961-62.

## Department of

# Physics

PROFESSOR John K. Wood, HEAD; ASSOCIATE PROFESSORS Robert L. Berger, Jack E. Chatelain, Jurgen R. Meyer-Arendt; ASSISTANT PROFESSORS W. Farrell Edwards, Jay O. Jensen, Akeley Miller.

## Office in Engineering and Physical Science 201

*Bachelor of Science Degree.* Requirements for a Physics major: Forty-five credits, of which thirty credits must be upper division courses. Certain approved courses in upper division Engineering, not to exceed ten credits, may be counted. As a major you must complete a senior project approved by the Department. The following sequence of courses is recommended if you wish to continue in graduate study **physics**:

*Freshman Year:* Mathematics 35, 46, 97; Chemistry 3, 4, 5; English 1, 2, 3; German, Russian, or other group electives.

*Sophomore Year:* Physics 20, 21, 22; Mathematics 98, 99, 110; German, Russian, or other group electives.

*Junior Year:* Physics 166, 167, 168 or electives; Physics 153, 154, 155; Mathematics 130, 131, 132 or 140, 142; Chemistry 104, 105, 106, 109, 110, 111 or electives; Physics 188 (taken with Physics 153, 154, 155 or 146) E.E. 101 or electives.

*Senior Year:* Physics 175, 176, 177, 120, 121, 130, 166, 167, (or electives) 188, 131.

Students interested in entering the field of biophysics should plan their group electives so as to obtain as broad a background as possible. It is suggested that electives beyond the group requirements be taken in the biological sciences and chemis-

try, especially Chemistry 121, 122, 191, and Physiology 130, 131.

A *minor in physics* will be approved on completion of nine credits from the following upper division Physics courses: 107, 115, 122, 133, 140, 130, 131.

*Teaching Major:* If you desire a teaching major in Physics or a composite teaching major in Physics and Math, you should complete the following minimum program: Physics 17, 18, 19, 122, 130, 131, three credits in 188; Math. 35, 46, 97, 98, 99, 110. Required professional education courses for the teaching certificate are listed in the College of Education.

## Graduate Study

*Master of Science Degree.* As a candidate for the degree of Master of Science in Physics you must take an entrance examination administered by the department and present general Physics, general Chemistry, Calculus, one additional year of Mathematics and upper division courses in five of the following areas: Mechanics, Heat and Thermodynamics, Geometrical and Physical Optics, Electricity and Magnetism, Modern and Nuclear Physics, Meteorology, Physical Chemistry, Electronics, Sound. If you have fewer than six credits in certain of these five fields, you may be requested to take additional work in those areas as part of the work for the Master's degree.



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**Doctor of Philosophy Degree.** The Physics department in cooperation with related departments offers the Doctor of Philosophy degree in Physics and in Biophysics. The examination schedule for this degree is as follows: Entrance examination; qualifying examination at the start of the second year of study; language examinations in German and French or Russian; comprehensive examination any time prior to one year before the final examination on the thesis. Detailed information may be obtained from the department or from the dean of the School of Graduate Studies.

### Physics Courses

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. (4F, W, S) **Staff**
16. **Introductory Meteorology.** A non-mathematical treatment of physical laws governing the atmosphere and its phenomena. Brief study of the polar-front-theory, air-mass analysis, weather map reading, forecasting, and information required by the Civil Aeronautics Adm. for flying. (3F) **Jensen**
- 17, 18, 19. **General Physics.** Mechanics, electricity, magnetism, heat, light, sound, atomic and nuclear physics for non-science majors. Prerequisite: Math 26 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, 5S) **Staff**
- 20, 21, 22. **General Physics-Science.** Mechanics, electricity, magnetism, heat, light, sound, atomic and nuclear physics for science majors and engineers. Prerequisite: Math 97. Recommended: concurrent registration in Math 98. To be taken in sequence except with permission of instructor. Two lectures, three recitations and one lab per week. (5F, 5W, 5S) **Staff**
31. **Physical Science.** Selected topics from physics to show the procedures used in physics and how they are related to other experience and thought. Intended to help satisfy physical group requirement. Three lectures, one lab. (4W, S) **Staff**
- Calculus and Physics 17, 18, 19 or 20, 21, 22 are prerequisite for all courses numbered above 100 except 107 and 115.
107. **History and Literature of Physical Science.** Prerequisite: one quarter course in physics or permission of instructor. Three lectures. (3S, 3Su) **Staff**
115. **Demonstration Techniques in Physics.** Study and use of the equipment and methods necessary for visualizing the problems studied in physical science. Students are required to build simple experiments and present them before the class. Prerequisite: At least one quarter of physics or permission of the instructor. Two lectures, one lab. (Credit arranged) **Staff**
117. **General Meteorology.** Physics of the Air. Atmosphere physics and weather phenomena, using both dynamic and synoptic procedures. Brief study of meteorological apparatus, observations, map reading, forecasting, and basic principles of aeronautical meteorology. Prerequisites: Physics 19 or 22 and Calculus. Four lectures, one lab. (5S) **Jensen**
- 120, 121. **Modern Physics.** A study of electrons, ions, atomic structure and radiation. Prerequisite: Physics 154 or 177. (3F, 3W) **Edwards**
122. **Modern Physics.** For engineering, science, and teaching majors. (3F) **Jensen**
130. **Nuclear Physics.** A survey of methods and results of recent investigations of nuclear processes. To follow Physics 121. (3S) **Edwards**
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, S) **Staff**
132. **Nuclear Reactor Physics.** Recommended for senior engineering and physics majors interested in nuclear science. Prerequisite: Physics 122 or equivalent. (3W, S) **Staff**
133. **Nuclear Reactor Physics Laboratory.** Recommended for senior engineering and physics majors interested in nuclear science. Prerequisites: Physics 122 or equivalent and Physics 131. (2W, S) **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. Prerequisites: Physics 17, 18, 19 or 20, 21, 22. (3F) **Meyer-Arendt**

**141. Radiobiology.** For students in Medical Technology, Botany, Zoology, Pre-medicine, Pre-veterinary, Agriculture, fundamental techniques in health physics, radiation monitoring and measurings and isotope handling. Prerequisite: 1 quarter general physics. (3W)

Jenson

**142. Biophysics II.** Quantitative biology. Underlying physical principles involved in biophysical phenomena. (3S)

Berger

**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

**146. Sound.** An intermediate course in sound and vibration. (3S)

Wood

**153, 154, 155. Analytical Mechanics.** Prerequisite: Differential Equations. (3F, 3W, 3S)

Chatelain

**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. Credit for lab arranged. (3F, 3W, 3S)

Meyer-Arendt

**175, 176, 177. Electricity and Magnetism.** Electrostatics, magnetostatics, D.C. and A.C. circuits, electromagnetism, and electromagnetic theory. Use of the calculus and differential equations. (3F, 3W, 3S)

Miller

**188. Special Problems in Experimental Physics.** A laboratory course to give the advanced student experience with precision instruments and their use in physics. Must be taken with Modern Physics, Electricity and Magnetism, Optics and Acoustics. 1 to 3 per quarter. (F, W, S)

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. All upper division physics majors are required to register. (1F, 1W, 1S)

Staff

**196, 197, 198. Selected Reading in Physics.** (1F, 1W, 1S)

Staff

Courses numbered above 200 may be taken by undergraduates only with the approval of the instructor and the head of the department.

**210, 211. X-Ray Diffraction; X-Ray Crystallography.** (3W, 3S)

Wood, Miller

**214. Soil Physics.** (See Agronomy 214.)

**220, 221, 222. Atomic Spectra, Molecular Spectra, and Spectroscopic Measurements.** (5F, 5W, 5S)

Berger

**230, 231, 232. Nuclear Physics.** (3F, 3W, 3S)

Edwards

**E.E. 232. Electromagnetic Fields and Waves.** See Electrical Engineering.

**240, 241, 242. Advanced Biophysics.** (3F, 3W, 3S)

Berger

**250. Research in Physics.** Credit arranged. (F, W, S)

Staff

**260, 261, 262. Thermodynamics, Kinetic Theory, Statistical Thermodynamics.** (3F, 3W, 3S)

Berger

**270, 271, 272. Quantum Field Theory.** (3F, 3W, 3S)

Chatelain

**285, 286, 287. Introductory Quantum Mechanics.** Prerequisite: Advanced Calculus. (3F, 3W, 3S)

Chatelain

**290, 291, 292. Theoretical Mechanics.** (3F, 3W, 3S)

Edwards

**293, 294, 295. Graduate Seminar in Physics.** (1F, 1W, 1S)

Staff

**296, 297, 298. Theoretical Electricity and Magnetism.** (3F, 3W, 3S)

Chatelain

## 220 College of Humanities and Sciences

### Department of

# Speech

PROFESSORS *Rea E. Robinson*, HEAD, *Chester J. Myers*; ASSOCIATE PROFESSOR *Burrell F. Hansen*; ASSISTANT PROFESSOR *Gwendella Thornley*.

Office in Main 77

*Bachelor of Science Degree.* The Department of Speech offers training in Interpretation, Public Address, Radio and Television Broadcasting, and Clinical Speech. The requirements of 45 credits for a *departmental major* or a *teaching major* in Speech are as follows: Public Speaking, eight credits (Speech 125 required of all majors); Interpretation, eight credits (Speech 124 required of all majors); Theatre Arts, eight credits. (Theatre Arts 1 and 50 required of all majors); Speech Correction, five credits (Speech 167 required of all majors); Radio and Television, six credits; elective courses in Speech, ten 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.

If emphasizing radio-television in the speech major, you are required during your junior and senior years to obtain one year's broadcast experience at a commercial or educational television or radio station.

If you are emphasizing clinical speech and desire to comply with minimum standards for certification you must satisfactorily complete the following Speech courses: 7, 111, 167, 169, 171, 173, 175, 177. An additional fourteen quarter hours in psychology are required, including Child Psychology or Child

Development, Mental Hygiene, and Psychology of the Exceptional Child. If seeking certification in Clinical Speech you are exempt from the Theatre Arts requirement and one half of the Radio and Television requirement.

*For a composite English-Speech major*, you must have the following speech courses: Public Speaking, eight credits; Interpretation, eight credits; Theatre Arts, eight credits; Speech Correction, five credits; Radio-TV, three credits; Teaching of Speech, three credits. For a distribution of these courses see first paragraph above. For English courses needed for the English-Speech composite major see English Department in this catalog.

*For a composite Speech-Theatre Arts major*, you must have the following speech courses: Public Speaking, eight credits; Interpretation, eight credits; Speech Correction, five credits; Radio-TV, three credits; Teaching of Speech, two credits; Elective speech courses, eight credits. For a distribution of these courses see first paragraph above. For Theatre Arts courses needed for the Speech-Theatre Arts composite major see Fine Arts Department: Theatre Arts, in this catalog.

### Graduate Study

*Master of Science Degree.* The Department of Speech offers a

Master of Science degree in the following fields: Interpretation, Public Address Broadcasting, and Clinical Speech.

The following speech courses may be used for graduate credit by students majoring in the Speech Department or by students in other departments: 110, 111, 123, 124, 125, 169, 171, 173, 181, 182, 184, 185, 186, 190.

The Department of Speech in cooperation with the Department of Psychology offers a composite Master of Science degree in Psychology and Clinical Speech.

## 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, S) **Staff**
3. **Practice in Speaking.** For students whose experience in Basic Communications 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, S) **Thornley**
4. **Principles of Reading.** Effective oral and silent reading. A preparatory course for understanding and appreciation of the printed page. (5F, W, S) **Thornley**
12. **Individual Problems.** Individual attention given in private to your 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, S) **Staff**
- \*\*16. **Dialect.** The most prominent dialect forms, their principles and uses. The dialect work of Burns, Kipling, Drummond, Riley, Dunbar, Harris, Kirk and other writers are studied. (3S) **Myers**
21. **Intermediate Public Speaking.** You work with types of speaking most interesting and useful to you. You determine 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, S) **Staff**

24. **Oral Interpretation.** Lecture and Recital. Various literary forms are studied for platform presentation. Reading from manuscript and from memory. Preparation and presentation of public recital in reading. (3F) **Myers**

75. **Remedial Speech.** For persons with a noticeable difficulty in speech: in articulation, quality, pitch, intensity, stuttering, or rhythm. Time and credit arranged. Consult instructor before registering. May be taken more than one quarter. (F, W, S) **Staff**

\*\*77. **Phonetics and Voice.** An analysis of the phonetic and phonatory aspects of speech. (3W) **Staff**

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 develop 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 84. (3S) **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. One lecture and 3 hours laboratory per week. (3F, W, S) **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, or S) **Staff**

107. **Speech Improvement in the Elementary Classroom.** Designed to provide the teacher with techniques to improve the speaking skills of normal and speech handicapped children in the elementary grades. (3Su) **Staff**

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. Emphasis on situations in business and industry for Industrial Management students. (3W, S) **Robinson**

\*\*Taught 1962-63.

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**\*110. Play Reading.** Attention given to cutting and building for public programs. (3S)

**Myers**

**\*111. Psychology and Semantics of Speech.** Principles of psychology which underlie speech. Personal adjustment through speech. An insight into the process of symbol use. (3S)

**Staff**

**112. Private Instruction.** Individual attention given in private to your 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, S)

**Staff**

**\*113. Argumentation.** Information and practice in techniques of analysis, investigation, evidence, reasoning, brief making, refutation, and construction and delivery of the argumentative speech. (3F)

**Robinson**

**114. Writing for Radio and Television.** (See Journalism) (3S)

**115. Intercollegiate Debating.** Members of debating squads may receive not more than three credits in any one year. (3F, W, S)

**Robinson**

**118. Story-Telling.** 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, S)

**Myers**

**123. Teaching of Speech.** Methods and problems peculiar to teaching of speech both in secondary schools and in speech areas for Basic Communications work in the University and in basic speech courses at the college level. Organization of courses and lesson plans included. Prerequisite: Instructor's consent. (3S)

**Myers**

**124. Advanced Interpretation.** The mastering of significant selections from great writers. Reading from manuscript and from memory. (5W)

**Myers**

**125. Speech Composition.** Advanced theory and practice of public speaking. You build and deliver several short speeches and read selected masterpieces from the world's public speaking literature. Prerequisite: Sophomore standing and Speech 1, or English 1, 2, 3. (5S)

**Robinson**

**167. 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. (5F)

**Staff**

\*Taught 1961-62.

\*\*Taught 1962-63.

**\*\*169. Speech Pathology I.** Organic voice defects studied. Cleft palate speech problem considered. Some attention given to the acquisition of substitute voice such as esophageal speech. Prerequisite: Speech 167. (5W)

**Staff**

**\*\*171. Speech Pathology II.** Study of language and speech problems due to lesions of the nervous system including Cerebral Palsy, Aphasia and other dysarthrias. Prerequisite: Speech 167. (5S)

**Staff**

**173. Clinical Practice.** Supervised diagnostic and remedial case work in speech pathology. Prerequisite: consent of instructor. May be taken more than one quarter. Credit arranged. Prerequisite: Speech 167. (F, W, S)

**Staff**

**\*175. Measurement of Hearing.** Acoustics, Anatomy and function of ear. Review of audiometric techniques. Types of hearing loss and their implications. (3W)

**Staff**

**\*177. Communication Problems of the Hard of Hearing.** Covers speech problems associated with hearing deficiencies. Instruction in lip reading is given. (2S)

**Staff**

**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.** Study and practice in the preparation and broadcasting of educational and informational programs. Acquaints teachers, Extension Service agents, civic workers, and others engaged in public informational activities with broadcast services. (3W)

**Hansen**

**185. Advanced Radio-TV Production.** Specialized production problems such as remote pickups, integration of recorded with live material, network and local studio coordination, special events and producing the educational TV program. Prerequisite: Speech 181. (Credit arranged) (F, W, S)

**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 to 5F, W, S)

**Hansen**

190. **Problems in Speech.** Selected work, individually assigned, handled and directed. Speech problems of mutual interest to you and the instructor are investigated and reported upon. Prerequisite: Instructor's consent. Credit arranged. (F, W, S) Staff

200. **Seminar in Speech.** Emphasis on the various fields of Speech. Research problems. (2F, W) Staff

201. **Thesis.** (2 to 5F, W or S) Staff

290. **Research Studies.** Advanced research in Speech and Theatrical Arts. Credit arranged. (F, W, S) Staff

## Department of

# Zoology

(Zoology, Entomology, Physiology,  
Pre-Dentistry, Pre-Medicine, Nursing)

PROFESSORS *Datus M. Hammond*, HEAD, *J. Sedley Stanford*, EMERITUS, *Thomas L. Bahler*, *Clyde Biddulph*, *Eldon J. Gardner*, *George F. Knowlton*, *William F. Sigler*; ASSOCIATE PROFESSORS *Donald W. Davis*, *Merrill H. Gunnell*, *B. Austin Haws*, *Gene H. Linford*; ASSISTANT PROFESSORS *Keith L. Dixon*, *Raymond T. Sanders*; COLLABORATORS *Robert N. Annand*, *George E. Bohart*, *Howard E. Dorst*, *Paul R. Fitzgerald*, *Elbert R. Jaycox*, *A. Earl Johnson*, *Edsel C. Jorgenson*, *Marshall D. Levin*, *William P. Nye*, *Heber F. Thornley*.

## Office in Forestry-Biological Sciences 105

*Bachelor of Science Degree.* For a major in Zoology the following courses must be taken: Zoology 3, 4, 101, 107, 112; Entomology 115 or Zoology 116; 118 or 119; 127 or 128; 131; also Entomology 13 and Physiology 121, 122. The following courses are recommended: Math. 34, 35, 44; Applied Statistics 131, 132; Chemistry 3, 4, 5, 121, 122; Physics 17, 18, 19; Botany 24, 25; Bacteriology 70, 71; Wildlife 160; Geology 3, 4. If you are planning graduate work leading toward the Ph.D. degree, study of foreign languages is recommended.

*For a pre-medical major in Zoology*, the listed pre-medical requirements must be completed, and in addition the following courses must be taken: Zoology 101, 107, 127 or 128, 131, and 116 or Entomology 115.

## 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.

## Zoology Courses

1. **Principles of Biology.** See Biology I under Integrated Courses in Program in General Education, College of Humanities and Sciences.



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**3. General Zoology.** An introduction to the principles of zoology, including consideration of the organization and functioning of animals, variety of animal life, ecology, reproduction, inheritance and evolution. Three lectures, two labs. (5F, W, S) **Staff**

**4. Vertebrate Zoology.** A study of the vertebrates with emphasis on structure, function, evolutionary relationships and some consideration of natural history. Prerequisite: Zoology 3 or equivalent. (5F, W, S) **Staff**

**101. Invertebrate Zoology.** The more important phyla of invertebrates, with some consideration of the local fauna. Prerequisites: Zoology, 3. Three lectures, two labs. (5S) **Staff**

**102. Human Genetics.** A beginning course covering the basic principles of genetics. Similar to 112 but less technical. Human genetics is emphasized. Not open to students with credit in 112. Prerequisite: At least one course in biological science. Five lectures. (5S) **Linford**

**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 3 and 4 or Botany 24 and 25. Four lectures, one lab. (5F, W, S) **Gardner**

**116. Parasitology.** Protozoa and worms parasitic in man, domestic animals and wild animals, and relationships between parasites and their hosts. Prerequisite: Zoology 3. Three lectures, two labs. (5S) **Bahler**

**118. Vertebrate Embryology.** An introduction to the principles of development of the vertebrates. Prerequisite: Zoology 4 or equivalent. Three lectures, two labs. (5W) **Dixon**

**119. Comparative Anatomy.** Fundamentals of structure of the main types of vertebrates are studied comparatively. Prerequisite: Zoology 4 or equivalent. Three lectures, two labs. (5S)

**121. Ornithology.** Structure, classification, distribution and annual cycles of birds, with emphasis on study of the local fauna in the field. Prerequisite: Zoology 4. Two lectures, two labs. (4S) **Dixon**

**122. Mammalogy.** Structure, classification, life histories and distribution of mammals; introduction to methods of field investigation. Prerequisite: Zoology 4. Two lectures, two labs. (4F) **Dixon**

**123. Natural History of Animals.** Identification, habits, food, distribution and other features of common Utah animals. Also, methods of collection and preparation of specimens for study, display and storage. Laboratory time is spent in making observations and collections in the field. Prerequisite: One or more courses in zoology. Two lectures, two labs. (4F) **Linford**

**127. Cytology.** Study of cells, both plant and animal, including techniques of study, intracellular morphology and subcellular organization. Two lectures, two labs. (4W) **Sanders**

**128. Elements of Histology.** Study of tissues, including characteristics of different kinds of tissues and the main organs. Three lectures, two labs. (5F) **Bahler**

**129. Histological Technique.** Techniques employed in making preparations of animal tissues for microscopic study. Three labs. (3W) **Bahler**

**131. Organic Evolution.** Critical study of the facts and theories pertaining to evolution. Prerequisite: One basic course in biological science. Zoology 102 or 112 recommended. (3W) **Gardner**

**150. Herpetology.** Classification, distribution, life habits, and identification of amphibians and reptiles, with emphasis on the local forms. Prerequisite: Zoology 4. Two lectures, two labs. (4F) **Gunnell**

**155. Ichthyology.** Ecology, classification, and life histories of native and introduced fishes. Two lectures, two labs. (4W) **Sigler**

**201. Special Problems.** Individual study of a problem under the guidance of a staff member. Credit arranged. (F, W, S) **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 techniques and concepts in modern biological thought. Prerequisite: Zoology 107. (3F) **Sanders**

**214. Advanced Genetics.** Intensive study of heredity and variation with emphasis on current research. Prerequisite: Zoology 102 or 112. (3S) **Gardner**

**231. Genetics and Speciation.** Mechanics of heredity and variation applied to processes of evolution in plant and animal groups. Prerequisite: Zoology 102 or 112; Wildlife 160 recommended. (3W) **Dixon**

**233. Zoogeography.** Principles governing the distribution of animals, with emphasis on terrestrial vertebrates, and of 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. (4F) **Hammond**

**236. Advanced Parasitology.** Detailed study of certain parasitic protozoa and helminths, with emphasis on current research. Prerequisite: Zoology 116. (2S) **Hammond**

**240. Research and Thesis.** Research connected with problem undertaken for partial fulfillment of requirement for Master of Science or Ph.D. degree. Credit arranged. (F, W, S)

**251. Seminar.** Attendance required of all graduate students in residence in department each Fall quarter. Fundamental problems relating to current researches in zoological science are discussed by faculty, graduate students, and advanced undergraduates. (1F) **Staff**

**262, 263. Seminar in Vertebrate Zoology.** Required of all graduate students in Vertebrate Zoology each winter and spring quarter while in residence. Seniors and others interested may participate with the permission of the instructor. (1W, 1S) **Dixon**

**272, 273. Seminar in Genetics.** Required of all graduate students in Genetics each winter and spring quarter while in residence. Seniors and others interested may participate with the permission of the instructor. (1W, 1S) **Gardner**

**282, 283. Seminar in Parasitology.** Required of all graduate students in Parasitology each winter and spring quarter while in residence. Seniors and others interested may participate with permission of instructor. (1W, 1S) **Hammond**

## Entomology

*Bachelor of Science Degree. For a major in Entomology, the following courses are required: Zoology 3, 101, 107, 112, 131; Entomology 13, 103, 104, 108, 111, 112, 115; Botany 24, 25, 30, 130; Chemistry 3, 4, 5, (or 10, 11, 12) 121, 122;*

*Mathematics 35; Wildlife Management 160. The following are recommended: Zoology 4; Entomology 21, 120, 230; Agronomy 118; Applied Statistics 131, 132; English 111; Horticulture 131; Physics 6, 7. If you are planning graduate work you are advised to study a foreign language and take Chemistry series 3, 4, 5, 121, 122.*

*For a major in Agricultural Entomology under the College of Agriculture, the requirements of that College as well as those of Entomology must be completed.*

## 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 Management. (5S) **Haus**

**\*21. Social Life of Honey Bees.** Honey bees are among the most highly developed animals with respect to social organization. Factors in this social organization are studied, including communication and physiology. The elements of beekeeping are also considered, including practice in handling bee colonies. (2S) **Levin**

**† 103. Systematic Entomology.** Classification of insects. Insect collection required. Prerequisite: Entomology 13. One lecture, one lab and field collecting. (3F) **Davis**

**104. Advanced Systematic Entomology.** A study of the principles of classification and the rules of zoological nomenclature. Practice is given in the preparation of keys, description of species, and scientific illustration. Prerequisite: Entomology 103. One lecture, two labs. (3W) **Davis**

**105. Forest Entomology.** Principal insects attacking forests and forest products. Some attention is also given principles of biological control. Two lectures, two labs. (4F) **Davis**

**106. Insect Ecology.** Ecological principles as applied to insects, including fundamental con-

\*Taught 1961-62.

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cepts 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: Zool. 3 and Ent. 13. (3F) **Staff**

**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) **Haws**

**112. Insect Physiology.** Function of the organ systems of insects. Prerequisite: Entomology 111. Three lectures, two labs. (5W) **Haws**

**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 3 or equivalent. Two lectures, two labs. (4W) **Haws**

**\*\*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**

**138. Aquatic Entomology.** Identification, distribution, life histories and adaptations of aquatic insects, with particular reference to local streams and lakes. Two lectures, one lab. (3S) **Staff**

**210. Special Problems.** Individual study under staff guidance. Prerequisite: Entomology 13, 103, 108. Credit arranged. (F, W, S) **Staff**

**\*\*230. Insects in Relation to Plant Diseases.** A study of the insect vectors of plant diseases, including modes of transmission, nature of the pathogens and interrelationships of the pathogen, insect and host plant. Prerequisite: Entomology 108 or Botany 130. Two lectures, one lab. (3W) **Davis**

**\*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. Two lectures, one lab. (3W) **Davis**

**\*233. Aphidology.** Morphology, biology and taxonomy of aphids. Prerequisite: Entomology 103. (2W) **Staff**

**250. Research and Thesis.** For research connected with problem undertaken for partial fulfillment of requirements for Master of Science or Ph.D. degree. Credit arranged. (F, W, S) **Staff**

**262, 263. Seminar in Entomology.** Required of all graduate students in Entomology each winter and spring quarter while in residence. Seniors in Entomology and others interested may participate with the permission of the instructor. (1W, 1S) **Staff**

## Physiology

*For a major in Physiology* the following courses must be taken: Physiology 4, 121, 122, 130, 141, 151; Zoology 3, 4, 107, 112, 118, 119, 127, 128 and 131; Biochemistry 190. Recommended are Mathematics 34, 35 and 44; Physics 17, 18, 19; Chemistry 3, 4, 5, 115, 121, 122; Bacteriology 70, 71; and at least one year of a foreign language.

*For a minor in Physiology* the following courses are required: Physiology 4, 30, 121, 122 and 20 or 141.

## Physiology Courses

**4. Human Physiology.** For the student who desires a survey of physiology but who is not planning advanced intensive study. It deals with the functioning of the human body, with emphasis upon broad general biological principles. Prerequisite: Biology 1 or an equivalent course in principles of biology. Five lectures, one lab. (5F, W, S) **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. (3W) **Linford**

**30. Experimental Biology.** An introduction to the basics of biological experimentation, both plant and animal. Fundamental principles of biology will be considered on a level more advanced than in Principles of Biology. Pre-

\*Taught 1961-62.

\*\*Taught 1962-63.

requisites: Principles of Biology or its equivalent or Physiology 4. Four lectures, 1 lab. (5F, 5S) **Sanders**

**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 4, Chemistry 12. Three lectures, two labs. (5S) **Sanders**

**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, Physiology 4, Zoology 3 or 4, Chemistry 3, 4, 5, 121, 122 or equivalent and a course in physics are required. Three lectures, two labs. (5F, 5W) **Biddulph**

**130. Cellular Physiology.** A study of physiological functions at the cellular level. As preparation, Physiology 4 or its equivalent, Chemistry 12, or 121 and 122 and Physics 17, 18 and 19 or equivalent are recommended. Three lectures, two labs. (5W) **Sanders**

**141. Endocrinology.** The glands of internal secretion, with emphasis on the hormones in reproduction. As preparation, Physiology 4, Zoology 3 and 4 and a course in organic chemistry are required. (3F) **Biddulph**

**151. Comparative Physiology.** A comparative study of organ function in the animal kingdom. Prerequisite: Physiology 121, 122 or 130. Five lectures. (5S) **Sanders**

**201. Special Problems.** Laboratory course for special investigations in physiology. Prerequisites: Physiology 121, 122 or special permission. (2 to 5F, W, S) **Staff**

**241. Physiology of Reproduction.** A laboratory course for studying physiology of reproduction in animals. Prerequisite: Physiology 141. Two lectures, one lab. (3W) **Biddulph**

**261. Physiology of Response.** Nerve-Muscle. 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, 1S) **Staff**

**282, 283. Seminar in Physiology.** Required of all Physiology graduate students each Winter and Spring quarter while in residence. Seniors in Physiology and others may enroll with the permission of the instructor. (1W, 1S) **Staff**

**291. Research and Thesis.** Research connected with problem undertaken for partial fulfillment of requirements for Master of Science or Ph.D. degree. Credit arranged. (F, W, S) **Staff**

## Pre-Dentistry

If planning to enter dentistry you may take the necessary courses in the College of Humanities and Sciences to satisfy requirements for admission to any school of dentistry in the United States.

### Suggested pre-dental schedule:

FRESHMAN		F	W	S
Chemistry 3, 4, 5 .....		5	5	5
Mathematics 34, 35, 44 or 46 .....		3	5	3
English 1, 2, 3 .....		3	3	3
Air Sci., Military Sci., or P. E. <sup>1</sup> ....		1	1	1
Electives (optional) .....		3	2	5
Total .....		15	16	17

SOPHOMORE		F	W	S
Zoology 3, 4 .....		5	5	...
Physics 17, 18, 19 .....		5	5	5
Air Sci., Military Sci., or P. E. <sup>1</sup> ....		1	1	1
Electives (optional) .....		6	6	11
Total .....		17	17	17

JUNIOR <sup>2</sup>		F	W	S
Chemistry 121, 122 .....		5	5	...
Zoology 118 or 119 .....		...	5	or 5
Electives .....		8	7	12
Total .....		17	17	17

Recommended electives are Psychology, History, Political Science, Sociology, Economics, Scientific Vocabulary, and other English courses.

<sup>1</sup>Military Science or Air Science 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.

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If planning to receive a B.S. degree in a combined curriculum (three years here and one year in a dental school) you must fulfill the group, English composition, and military requirements of USU and must complete a minimum of 141 credits of pre-professional work.

### Pre-Medicine

The College of Humanities and Sciences offers the courses to provide a pre-medical training that satisfies entrance requirements of medical schools in the United States and Canada.

#### *Suggested pre-medical schedule:*

FRESHMAN				
	F	W	S	
English 1, 2, 3 .....	3	3	3	
Chem. 3, 4, 5 .....	5	5	5	
Math. 34, 35, 44 or 46 .....	3	5	3	
Air Sci., Military Sci., or P. E. <sup>1</sup> ....	1	1	1	
Electives .....	3	3	5	
Total .....	17	17	17	

SOPHOMORE				
	F	W	S	
Zoology 3, 4 .....	5	5	—	
Foreign Language .....	5	5	5	
Physics 17, 18, 19 .....	5	5	5	
Electives .....	2	2	7	
Total .....	17	17	17	

<sup>1</sup>Military Science or Air Science would be two credits each quarter.

### JUNIOR

	F	W	S
Chem. 121, 122 .....	5	5	—
Zoology 112 .....	5	—	—
Zoology 118 .....	—	5	—
Chem. 115 .....	—	—	5
Electives .....	7	7	12
Total .....	17	17	17

Electives should be chosen from the humanities, arts and social sciences. Some medical schools require or recommend Comparative Anatomy.

If interested in graduation from USU before attending medical school you may major in any subject.

If interested in a pre-osteopathic program you should consult the pre-medical adviser.

If planning to receive a B.S. degree in a combined curriculum (three years here and one year in a medical school) you must fulfill the group and English composition requirements of USU and must complete a minimum of 141 credits of pre-professional work.

### Nursing

If you have Registered Nurse credentials you may pursue studies toward a Bachelor of Science degree in nursing. Credits earned toward the R.N. are applied toward the B.S., as evaluated by the Registrar. You may be graduated with a major in Nursing or you may complete your University work in such a field as Public Health or Bacteriology.



*Division of  
Military and Air Sciences*





## Division of Military and Air Sciences

*Joint Army-Air Force Courses and Activities, 232*

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### Degrees Offered:

Bachelor of Science

also, ROTC Commission

Division of

## Military and Air Sciences

*J. Elliot Cameron, UNIVERSITY ROTC COORDINATOR*

*Colonel Chester H. Anderson, PROFESSOR OF MILITARY SCIENCE*

*Major Lloyd R. Pugh, Jr., PROFESSOR OF AIR SCIENCE*

Each male citizen of this country has an 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 as officers with the Active or Reserve Military forces.

Two separate ROTC units are located at Utah State University: Army and Air Force. You may initially choose which program you wish to enter; however, subsequent transfer between units is not generally approved because of the difference in curriculum.

*Army and Air Force ROTC are four-year programs, each consisting of two two-year courses. The Basic course is normally taken during your freshman and sophomore years. It consists of six quarters of work, including drill periods. The Advanced course of the ROTC program is normally taken during your junior and senior years and consists of six quarters of work plus a summer camp (between the junior and senior years). 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. Physically and mentally 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 is a pre-requisite for your entrance into the Advanced course unless constructive credit is granted for previous active military service.

Satisfactory completion of both the Basic 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 their academic subjects and in ROTC. Upon completing the program and being commissioned, you normally enter on active duty with the Armed Forces as a second lieutenant in the service in which you are commissioned. The period of active service required of ROTC graduates depends on the require-

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ments 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. ROTC Band students drill separately under the supervision of the University director of bands.

A combination uniform and laboratory fee of \$5 is required of all ROTC students and is paid at the time of initial enrollment each year.

### General Requirements

#### (A) Basic Course:

(1) Be a citizen of the United States.

(2) Not less than 14 years of age.

#### (B) 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 which is administered to sophomore students.

(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 military or air science grades, scores in the tests, moral character, leadership, and officer potential.

(6) Have at least two years of college remaining before becoming eligible for a degree. It is desirable, but not required, that you

complete the ROTC program and the requirements for a degree simultaneously.

(7) Transfer membership in any reserve organization of the Armed Forces to the respective ROTC service. Staff personnel of the department will assist you as necessary.

### Joint Army-Air Force Courses and Activities

*Sponsor Corps.* A semi-military organization composed of 75 coeds chosen for the Corps by Army, Air Force and Sponsor Staff, with final selection being made by a composite board of judges. Former members of Sponsor units recognized by the national organization may transfer upon application. Try-outs 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 Departments in furthering their aims of military interest on campus.

*ROTC Band.* A military band under the direction of the College band instructor, but governed by the policies of the Departments of Military and Air Science. Students selected for the band will enroll for Military or Air Science classroom work but drill with the band.

*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. Membership in Pershing Rifles is open to any Army or Air Force basic or ad-

vanced cadet. Included within the Pershing Rifles is a Rifle Company to promote marksmanship among Army and Air Force cadets. The Company competes in several regional and national invitational tournaments. The Pershing Rifle Drill Company enjoys a national reputation as a drill unit, and is open to all members of the Pershing Rifles.

*Scabbard and Blade.* The National Society of Scabbard and Blade is an honorary society of Advanced Army and Air Force Cadets. Company "A," 4th Regiment, was organized at USU in 1922. Members are dedicated to unite in closer relationship the military departments of the University, and to perform such services to the University and to the community which will result in the spreading of intelligent information concerning the military requirements of our country. Members are invited to join after being selected from among the outstanding advanced cadets on campus by

the society's current membership.

*Society of American Military Engineers.* A National professional society devoted to discussion, study, and training in problems related to Military Engineering.

### ROTC Band Courses

1B, 2B, 3B. ROTC Band. First Year. Staff  
4B, 5B, 6B. ROTC Band. Second Year. Staff

### Sponsor Corps Courses

51, 52, 53. Military Science Sponsors Drill, Freshmen. A course in leadership organization and drill for women elected to Corps of Sponsors (1F, 1W, 1S) Staff  
54, 55, 56. Military Science Sponsors, Sophomores. (1F, 1W, 1S) Staff  
151, 152, 153. Military Science Sponsors Drill, Juniors. (1F, 1W, 1S) Staff  
154, 155, 156. Military Science Sponsors Drill, Seniors. (1F, 1W, 1S) Staff

### Pershing Rifles Courses

37, 38, 39. Pershing Rifle Drill, Freshmen. (1F, 1W, 1S) Wise  
40, 41, 42. Pershing Rifle Drill, Sophomores. (1F, 1W, 1S) Wise  
137, 138, 139. Pershing Rifle Drill, Juniors. (1F, 1W, 1S) Wise  
147, 148, 149. Pershing Rifle Drill, Seniors. (1F, 1W, 1S) Wise



Department of

## Military Science

PROFESSOR Colonel Chester H. Anderson; ASSISTANT PROFESSORS Lt. Col. J. LeRoy Walker, ARTILLERY; Major Lewis A. Cville, INFANTRY; Captain Cecil E. Wise, CORPS OF ENGINEERS; INSTRUCTORS Sergeant First Class Thomas R. Post, Sergeant First Class Henry M. Sato, Sergeant Robert I. Meline; ADMINISTRATIVE NCO Sergeant Edward J. Dybrowski.

### Office in Military Science 101

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 you must not have reached your 28th birthday prior to appointment. If you are commissioned in the Army Reserve and unless you are a veteran or have completed flight train-

ing, you will be required to serve either six months or two years on active duty. If a veteran, you may serve six months or no active duty—or you may request two years active duty if you desire. If you participate in flight training, you must serve three years on active duty.

The Army ROTC offers a four-year program. It consists of two courses: Basic and Advanced. It is elective on your part as to whether or not you enroll in the Basic Course. After completion of the two-year Basic course and selection for further training, you 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 pre-requisite to his graduation. Therefore if you enroll in the Advanced course, you must complete that course unless relieved of this obligation by regulations prescribed by the Secretary of the Army. Signing of an ROTC draft deferment agreement as a Basic course student obligates you to elect enrollment in the Advanced course, if you are selected for it.

*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. Strictly military courses have been reduced in scope and credit. In offsetting this reduction, during your MS I year you must earn a minimum of 3 quarter hours in one of the approved academic areas. During the MS III and MS IV years, you must earn a minimum of 4 quarter hours 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 your adviser or from the staff at the Military Science Department. You will find that these are not additionally required courses but in effect ones granting "dual credit" — they fill requirements for your 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 your regular academic schedules. For acceptance in the course, you must be enrolled in MS IV ROTC or have successfully completed MS IV and summer camp, and be scheduled to graduate from the University within the same academic year. Academic credit may be arranged upon completion of the program. The flight program consists of 71½ hours of training: 35 hours of ground and 36½ hours of actual flight instruction. Completion of this training may qualify you for a FAA private pilot's license. All training is conducted by FAA-approved instructors. If you are interested in participating in flight training you should see your 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 your junior and senior years unless a subsequent period is specifically approved by the Professor of Military Science. Practical application of classroom theory and living in the field make it an interesting and stimulating experience. You receive pay for the six week period and for travel to and from camp.

*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



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credit for the first year Basic course.

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 to qualify for a major in Military Science if you fail 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, you should concentrate on filling lower division group requirements and strive for a high grade point average.

*Payment to Advanced Students.* Upon enrollment in the Advanced course, you are paid a "Subsistence Allowance" amounting to approximately \$27 per month. These payments normally continue from time of enrollment until completion of the course and include normal vacation periods. Veterans receive this in addition to any payments under the GI Bill.

*Delay of Entry on Active Duty.* When you have completed the Army ROTC program and are commissioned you may delay entry upon active duty, if you wish to continue studies in certain fields. Information regarding specific fields of study and procedure may be obtained upon request.

### Basic Military Science MS I—First Year Basic

DIRECTOR: *Captain C. E. Wise*

#### Courses

11. **Military Science I.** Organization of the Army and ROTC; Individual Weapons and Marksmanship; Leadership, Drill and Command. One class period and one leadership laboratory period per week. (1F) **Anderson**
12. **Military Science I.** Continuation of Military Science 11. Individual Weapons and Marksmanship; U. S. Army and National Security; Leadership, Drill and Command. One class period and one leadership laboratory period per week. (1W) **Anderson**
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 period per week. (1S) **Anderson**

### MS II—Second Year Basic

DIRECTOR: *Captain C. E. Wise*

21. **Military Science II.** Map Reading; Leadership, Drill and Command. Prerequisites: Military Science 11, 12, and 13 or 24. Two class periods and one leadership laboratory period per week. (2F) **Wise**
22. **Military Science II.** Continuation of Military Science 21. American Military History; Leadership, Drill and Command. Two class periods per week. (2W) **Wise**
23. **Military Science II.** Continuation of Military Science 22. American Military History; Leadership, Drill and Command. Two class periods and one leadership laboratory period per week. (2S) **Wise**
24. **Military Science II.** Special Studies. This course offers special tutored study to students who have not been able to take Basic Courses at their regularly offered times. (2F, 2W, 2S) **Wise**

## Advanced Military Science MS III—First Year Advanced

DIRECTOR: *Major L. A. Civile*

131. **Military Science III.** Leadership; Military Teaching Methods; Leadership, Drill and Command. Two class periods per week and one leadership drill period per week. (2F)

*Civille*

132. **Military Science III.** Continuation of Military Science 131. Organization, Function, and Mission of Arms and Services; Small Unit Tactics; Leadership, Drill and Command. Two class periods and one leadership laboratory period per week. (2W)

*Civille*

133. **Military Science III.** Continuation of Military Science 132. Small Unit Tactics and Communications; Leadership, Drill and Command. Two class periods and one leadership laboratory period per week. (2S)

*Civille*

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)

*Staff*

## MS IV—Second Year Advanced

DIRECTOR: *Lt Col J. L. Walker*

141. **Military Science IV.** Operations; Military Law; Leadership, Drill and Command. Two class periods and one leadership laboratory period per week. (2F)

*Walker*

142. **Military Science IV.** Continuation of Military Science 141. Military Administration and Personnel Management; Role of US in World Affairs. Two class periods and one leadership laboratory period per week. (2W)

*Walker*

143. **Military Science IV.** Continuation of Military Science 142. Logistics; Service Orientation; Leadership, Drill and Command. Two class periods and one leadership laboratory period per week. (2S)

*Walker*

## Seminars

174. **Advanced Military Science Seminar Problems.** Prerequisite: Enrollment in or completion of Advanced Military Science. Credits arranged. (F, W, S)

*Walker*

201. **Advanced Military Science Seminar Problems.** Prerequisite: Graduate standing. Credits arranged. (F, W, S)

*Anderson*



## Department of

# Air Science

PROFESSOR *Major Lloyd R. Pugh, Jr.*; ASSISTANT PROFESSORS *Captains Joseph Fischle, Elwin E. Johnson, Richard W. Smith.*

## Office in Military Science 104

The purpose of Air Force ROTC is to prepare young men to serve as officers in the Reserve and Regular components of the Air Force. It is not the purpose of the course to train you in a specific field, but rather to give you an understanding of the mission and the global

responsibilities of the United States Air Force. The academic phase of the course develops a background in national and international affairs to help you intelligently interpret and evaluate world events.

*Summary of the AFROTC Curriculum.* The AFROTC curriculum

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has been designed to meet the following criteria: college level in content, scope, intensity and presentation; appeal to students in all academic fields; and preparation of students to undertake flying training upon graduation.

Study is divided into the basic course, covering the first two years, and the advanced course, covering the Junior and Senior years plus Summer Training. The course of study consists of instruction totaling 480 hours, allocated as follows: Freshman and Sophomore years, 90 hours each; Junior and Senior years, 150 hours each, and summer training, four weeks.

The basic course, *Foundations of Air Power*, is an introduction to the nature of Air Power with its political, economic, social and psychological influence on modern man. The advanced course, building upon this background, provides instruction designed to further develop your leadership potential. This is accomplished through attention to the development of skills in human relations (e.g., problem solving, group leadership techniques, writing, speaking and teaching techniques); and through increased understanding of the economic, political, social and geographical concepts involved in Air Force operations.

In addition, the curriculum includes: experiences designed to stimulate and develop a growing interest in the 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.

Throughout the Air Force ROTC course of study you are provided a general education complimentary

to the academic program of the University and with preparation for living in the Aero-Space Age. While this material is specifically intended to serve you as an Air Force Officer much of it will be useful to you in civilian occupations.

*Quotas and Physical Requirements.* There is no limitation on the number of young men who can be enrolled in the basic program. For the advanced program, however, a yearly quota is established by the Air Force. This quota is based on estimated Air Force needs for young officers of various skills and the projected officer production of the local AFROTC Detachment.

All cadets must meet the physical standards for general military service. Your physical examination for entry into the University will generally determine whether or not you meet these requirements.

*Veterans.* If a veteran you are accepted into the AFROTC program without regard to quota spaces. If you can complete the program prior to reaching age 28 and can meet the physical requirements for general service, you may be commissioned a Second Lieutenant in the Air Force Reserve and compete for a career as a regular Air Force Officer. You are not required to serve on active duty but may volunteer to do so. Parts of the basic program may be waived in lieu of prior military service. You may also compete for pilot and navigator spaces, and if accepted you must complete the Flight Instruction program (Pilots) in your Senior year and the active duty requirements.

*Special University and AFROTC Requirements.* Once you enter the basic or advanced program, successful completion of that program

becomes a requirement for graduation, unless you are relieved of the requirement by the Professor of Air Science or the President of the University. In addition, when you enter the Advanced Course, you must agree to accept an Air Force Commission, if it is offered to you, and to serve on active duty if directed to do so.

Upon your initial enrollment at the University, you should schedule Air Science classes to complete simultaneously your requirements for a degree and a commission. If an engineer under a five-year program you should plan your Air Science program in advance with your adviser and the AFROTC Director of Training in order to meet the above requirements.

Because of the differences in the Army and Air Force ROTC Programs, no credit is given for High School ROTC, although high school ROTC experiences are beneficial in the Air Science program. If you wish to qualify as a pilot or navigator, you must be able to finish the Air Science program and graduate from the University before you reach the age of 26½ years. Other cadets must complete the military program and graduate from the University prior to reaching the age of 28.

*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 Air Force 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.* As an advanced cadet, you are paid a subsistence allowance of approxi-

mately \$27 per month. The maximum amount paid for your Junior and Senior years is approximately \$600. While at Summer Training you will receive approximately \$81.00 plus travel pay for the round trip to and from camp.

*Summer Training.* One summer training camp of 28 days duration is required of all cadets in the advanced course. Normally, you will attend this camp between your Junior and Senior years at a selected Air Force Base. Cadets living in Utah and Idaho generally attend camp in California or Washington. Six quarter hours of college credit are granted for summer training.

*Flight Training.* AFROTC is concerned with two types of flight training. The first type is taken while you are a cadet at the University and the other after you have received your commission and have 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 CAA examination enables you to acquire a private pilot's license and to gain three hours of University credit. 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 your year of flight training in the U. S. Air Force as a Second Lieutenant, you will receive full pay and allowances, plus flight pay, a total of approximately \$5,600.00.

*Non-Flying Cadets.* In order to meet the challenge of the Aerospace Age, its Technological ad-

vances 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 areas of study. In many of these fields you may be granted a year delay to acquire an advanced degree prior to your call to active duty. After your call to active duty you will serve four years in your major field of study. Interested cadets may contact the AFROTC Education and Training Officer for information on Air Force specialist fields related to their academic major.

*Delay of Entry on Active Duty.* If you complete the AFROTC program and received your commission, you may request a delay in call to active duty if you desire to continue your studies toward a Master's 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 you.

*Air Force Chaplains.* If you meet special requirements, you may be commissioned as a chaplain in the Air Force. Selection rests with the Chief of Chaplains, United States Air Force, Washington, D. C. Interested individuals are urged to contact members of the AFROTC staff for further information.

*Air Force Library.* A library of Air Force periodicals and publications is maintained for the Air Force ROTC Cadet. Material relative to your Air Force ROTC curriculum is available to you.

*Air Force ROTC Counseling Service.* Air Force ROTC Detachment maintains counseling service for each cadet. Service is offered primarily in areas concerned with the AFROTC curriculum (Education, Study and Leadership).

## Air Science Courses

Two hours of Leadership Laboratory are required each week during the fall, winter and spring quarters.

### Air Science I—First Year Basic

#### Leadership Laboratory

10. **Air Science:** Introduction to the methods of Air Force organization and the requirements of "followership" at the element and flight level. Opportunities provided for the cadet to subject himself to personal and group discipline, to identify himself with a group, and to acquire the training, poise and self-confidence needed to conduct himself in a military manner. (1F, W) Staff

11. **Air Science:** Designated University Course

12. **Air Science:** Designated University Course

(Designated University Courses are two or three quarter hour courses normally offered by the university and which are approved by the Professor of Air Science as contributing to the professional education of an Air Force Officer. Generally the designated university courses are required subjects in the major field of study being pursued by the student.)

13. **Air Science: Foundations of Air Power.** A general survey of Air Power designed to provide the student with an understanding of the Military Instrument of National Security, Elements and Potentials of Air Power and the Evolution of Aerial Warfare. It includes a general survey of the historical development of United States Military policy, the Role of the Department of Defense, including the Air Force, Army and Navy in the maintenance of national security. The elements and potentials of Air Power provides the student basic knowledge concerning the fundamental nature of aviation and its impact on the modern world. This is followed by the Evolution of Aerial Warfare which is the development of Air Doctrine from World War I to the present. (Includes AS 10, Leadership Laboratory). (2S) Staff

14. **Sabre Squadron.** Sabre Squadron (Freshman) AS 14a, (1F); AS 14b, (1W); AS 14c,

(1S), Sabre Squadron (Sophomore) AS 24a, (1F); AS 24b, (1W); AS 24c, (1S). Sabre Squadron (Junior) AS 136a, (1F); AS 136b, (1W); AS 136c. Sabre Squadron (Senior) AS 146a, (1F); AS 146b, (1W); AS 146c, (1S). The Sabre Squadron is an honorary society for Basic AFROTC Cadets. Its purpose is to foster esprit-de-corps among Freshman and Sophomore Cadets; to offer service to Utah State University; to promote American citizenship; to provide leadership experiences; to promote Air Power concepts; to increase cadet knowledge of the mission and scope of the United States Air Force. Sabre drill is required. Staff

## Air Science II—Second Year Basic

20. Air Science: Leadership Laboratory. Practice in elementary leadership activities involving small groups and an introduction to leadership methods and Cadet Corps organization at the squadron and group level. The cadet is provided with opportunities to test his leadership skill in situations dealing with small groups and to recognize and accept personal responsibility. (1S) Staff

21. Air Science: Foundations of Air Power. A survey of air vehicles and basic principles of flight, elements and characteristics of aircraft, their guidance, control, navigation and propulsion. A discussion of targets, their selection, weapons and the delivery of these weapons. (Includes AS 20, Leadership Laboratory) (2F) Staff

22. Air Science: Foundations of Air Power. A general survey of the elements of aerial warfare to include Bases Materiel and Personnel. The professional opportunities available in the Air Force are discussed at this time. The course ends with a section on the Employment of Air Forces and Space Operations. (Includes AS 20, Leadership Laboratory) (2W) Staff

23. Air Science: Designated University Course. (For definition of Designated University Course, see Air Science 1 Curriculum.)

24. Sabre Squadron. See number 14. Sabre Squadron. (1F, W, S)

## Air Science III—First Year Advanced AFROTC Course

131. Air Science. Air Force Officer Development (1a). Taught in three phases: Communicating in the Air Force, the Air Force Commander and His Staff, and Instructing in the Air Force. Communicating in the Air Force is a study of learning techniques, barriers to effective learning, and speaking and writing skills. Instructing in the Air Force is a study of principles of learning, personal

and professional qualities of instructors, methods of instructing, instruction planning, and the use of visual aids. Practical experience in instruction is offered. The Air Force Commander and his Staff is a study of the functions and responsibilities of Air Force Commanders, delegation of authority to staff officers, and organization of military units. (3F) Staff

133. Air Science: Air Force Officer Development. Leadership and Management Seminar. Study consists of three phases, principles of leadership, the nature of man, and applications in leadership situations. All phases are integrated into the Air Force leadership and management problems. Insight and experience in Air Force leadership and management problems is provided through role playing, group and individual problem solving, group discussion and panel discussion. Translation of knowledge into speaking, writing and listening skills is also emphasized. Course is directed toward full development of the individuals leadership potentialities both as an Air Force Officer and a civilian leader. (3W) Staff

132. Air Science: Air Force Officer Development. Consists of two phases: creative problem solving and the military justice system. The first twenty-five hours are devoted to aspects of creative problem solving, thought processes, logic, imagination, creative thinking, scientific research method and the individual and group brainstorming. Practical application of techniques is provided through realistic problems of Air Force nature. The Military Justice System, involves a study of legal procedures in the Air Force. Rights, duties, and responsibilities under the Military Justice System are stressed. Mock court-martials are utilized in presentation of material. (8S) Staff

150. Air Science: Air Force ROTC Summer Training Unit. 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 communication, navigation, weather, survival training, air base security, aircraft traffic control, first aid and sanitation, supply, biological and chemical warfare. Pressure and altitude chamber experience complete with orientation lectures, as given to regular Air Force jet pilots, permits you 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. You participate in pre-flight and post flight briefings, and receive emergency equipment indoctrination. Demonstration and field trips are



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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 year. Exemption from attendance at this time is granted only by the Professor of Air Science based upon emergency situations of extreme hardship. If an exemption is granted, you must attend summer training at the end of your senior year and you will be commissioned upon successfully completing the summer training if your university degree requirements have been met. (6Su) **Staff**

### Air Science IV—Second Year Advanced AFROTC Course

**141. Air Science: Weather and Navigation.** A study of the weather and navigational aspects of airmanship, such as temperature, pressure, air masses, precipitation, weather charts, navigational charts and dead reckoning navigation. (3F) **Staff**

**142. Air Science: Military Aspects of World Political Geography.** Students will register for Political Science Course 150, World Political Geography. This is a study of strategic geographical areas of the world and the factors which influence the powers of states. Power is studied in relation to international politics and power alliances. (4W) **Petersen**

**143. Air Science: International Relations and the Air Force Officer.** Students will register for Political Science Course 111, International

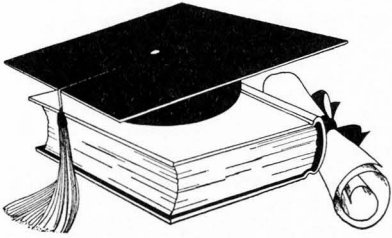
Government. This study examines briefly the attempts to achieve some type of international organization with major emphasis on the League of Nations and United Nations. One quarter hour is devoted to the study of material to help the cadet make a rapid effective adjustment to active duty as an officer in the United States Air Force. (3S)

**Anderson, Staff**

**143a. Air Science: Active Duty as an Officer.** This course is designed to help the student make a rapid and effective transition to active duty as an officer in the U. S. Air Force. Emphasis is placed upon a further development and application of leadership skills, responsibilities and obligations of the Armed Forces Officer, personal and professional considerations of military service. One hour of lecture and two hours of leadership laboratory per week are required. (1S) **Staff** (This course taken with Pol. Sci. 111 (International Organization) is the desired substitute for AS 143).

**145. Flight Instruction Program.** This course covers instructions in ground school, CAA Regulations, Radio and Airways procedures, navigation, general service and operation of aircraft. Flight instruction includes 36½ hours on light aircraft and includes: pre-flight checks, solos, cross country flights and a CAA flight examination. Subject open only to qualified senior AFROTC Cadets. Instruction arranged to not interfere with regular academic schedule. Prerequisite: 141. Navigation and Weather. (3W, S) **Staff**

**146. Sabre Squadron.** See Number 14. Sabre Squadron. (1F, W, S)



*School of Graduate Studies*

School of

## Graduate Studies

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School of

## Graduate Studies

J. Stewart Williams, Dean

Office in Main 182

There are nine graduate degrees offered at Utah State University: Civil Engineer, Irrigation Engineer, Master of Education, Master of Forestry, Master of Science, Master of Business Administration, Master of Industrial Education, Doctor of Education and Doctor of Philosophy.

Graduate study is supervised by the dean of the School of Graduate Studies, assisted by the Graduate Council. This council consists of one representative from each of the seven resident colleges of the University, and one from the Library. 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 constituted as follows: College of Agriculture, James A. Bennett; College of Business and Social Sciences, Leonard J. Arrington; College of Education, Arden Frandsen; College of Engineering, Cleve H. Milligan; College of Forest, Range and Wildlife Management, Lawrence A. Stoddart; College of Family Life, Ethelwyn B. Wilcox; College of Humanities and Sciences, Eldon J. Gardner; Library, Milton Abrams.

A graduate with a Bachelor's degree from USU or from any other accredited college or university may be admitted 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 five credits to complete all requirements for the Bachelor's degree, may be allowed to register in the School of Graduate Studies.

*An application for admission*, accompanied by transcripts of all previously earned credits, and by letters of recommendation, should be presented as far in advance of the day of registration as possible. You must be approved by the department in which you propose to work.

If you cannot qualify for the degree program in a particular field, you may be admitted to the School of Graduate Studies as a non-candidate student. Admission to this school does not imply admission to candidacy for a higher degree.

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 qualifying examination required by your major department must be taken as soon as possible after registration. The results of these examinations become a part of your file in the Graduate office. If you are found to be deficient in the work basic to the field in which you propose to study, you may be required to take undergraduate courses—which

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do not count in the minimum requirements for the advanced degree—to satisfy the deficiency.

*Supervisory Committee.* When it has been determined that you are acceptable as a possible candidate for a higher degree, the major professor will suggest a committee to assist in guiding your program and in conducting necessary additional qualifying examinations and the final examination. When your program has been determined and approved by your committee, you will be advanced to candidacy for a degree. Advancement to candidacy must be accomplished before the end of the winter quarter if you are to graduate at the following Commencement. When your 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 your committee.

*Thesis or Dissertation.* As a candidate for an advanced degree you usually must present a thesis or dissertation on a topic within the field of your major subject, which must represent from nine to fifteen hours of the credit presented for your masters degree, and as much as forty-five hours of credit for the doctors degree. The thesis must be a contribution to the field of knowledge, based upon your own research or a treatment and presentation of known subject matter from a new point of view. After final approval by the department, the thesis must be typewritten in standard form; and a copy must be submitted to each member of your advisory and examining committee at least two weeks before the date of your final examination.

After approval by the committee and the department, and after you have successfully passed the final examination, three copies of the final draft of the thesis must be deposited in the Graduate office. One of these copies will be deposited in the library, another sent to the department, and the third returned to you.

*Microfilming of Thesis.* You pay for microfilming your thesis, and the films are deposited in the University library. For master's candidates, the fee is five cents per page and you may obtain your own positive copy for a small additional charge. For doctor's candidates the fee is \$20 and the film is produced by and registered with University Micro-films, Ann Arbor, Michigan.

*Thesis Alternate.* The supervisory committee may permit the substitution of two advanced reports, valued at six 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."

If you are working under "Plan B" in general agriculture, the dean of the College of Agriculture will select a major professor to be the chairman of your supervisory committee. Your program must include a minimum of six credits each in the fields of Plant Science, Animal Science, and Agricultural Economics.

*Credit Load.* 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 4 credits of research or thesis.

*Graduate credit.* If you are properly registered in the School of Graduate Studies any course in the 100 series is recorded as graduate credit. If you are in education and interested in re-certification you should be sure you are registered in the School of Graduate Studies. Minimum requirement for such registration is the possession of a bachelor's degree from an accredited institution.

### Degree of

## Master of Science

The Master of Science degree is 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.* Your program for the Master's degree must include: (1) At least thirty credits taken on the Logan campus; thesis credit counts toward this residence requirement; (2) At least 45 credits in courses numbered 100 or above which are approved for graduate credit; (3) At least ten credits, exclusive of thesis, in courses numbered 200 or above (in Education at least 25 credits must be in courses numbered 200 or above); (4) A thesis with nine to fifteen credits, or thesis alternate.

*Final Examination.* As a candidate for a Master of Science degree you are required to pass a comprehensive final examination on the

subjects of your graduate study and on your thesis. This examination may be oral or written or both as your 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 a representative of the Graduate Council, is appointed to act as chairman of the examination and submits to the Graduate Council the results of the examination. If you are to receive your degree at the June Commencement, the date of the final examination should be not later than May 10.

*Time Limit.* Work for a Master's degree must be completed within six years from the date of matriculation as a regular student in the School of Graduate Studies if the work is done wholly or in part during the regular academic year. If the work is done entirely in summer sessions, a maximum of seven years is allowed. Older work may be revalidated by examination.

*Extension Course Credit.* The amount of extension class or other off-campus credit to be allowed will be determined in consideration of your entire course program. In no case will more than nine quarter hours of extension credit be allowed toward a degree, and the total of all off-campus credit may not exceed fifteen 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 you are doing graduate work. Credit toward a Master's degree



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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 your committee.

### Degree of

## Master of Education

*Degree Areas:* A course of study leading to the Master of Education degree is offered in the following areas: School Administration and Supervision, General Administration, Secondary Administration and Supervision, Elementary Administration and Supervision, Secondary Education, with specialization in selected teaching fields, Elementary Education, with specialization in selected teaching fields.

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 your 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 45 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, except that a minimum of

25 credits must be taken on the Logan campus; (2) A graduate minor of at least ten credits in a field other than education; (3) Specified courses in each of four 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 Forestry

The Master of Forestry degree is given upon completion of a course of study prescribed by the Department of Forest Management 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 your original field is related to Forestry.

### 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 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 *Seminar Report*. This report should demonstrate the student's competence in professional writing. The degree is awarded only when the candidate's over-all record, including course work, the Master's examinations and the Seminar Report, represent creditable accomplishment. Candidates for this degree must have had three years of successful teaching experience.

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.

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 compe-

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tence 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 including certain specific courses. (2) A program of at least 90 credits of approved graduate study beyond the Master's degree. (3) A minor field of study, with 20 credits of approved courses. (4) An acceptable dissertation for which a maximum of 18 credits may be given. (5) Four quarters of residence at Utah State University, three of which must be in consecutive sequence (minimum 12 hours 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.

### 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 Engineering, Agronomy, Animal Husbandry, Bacteriology, Nutrition and Biochemistry, Botany, Chemistry, Civil Engineering, Electrical Engineering, Entomology, Forest Management, Horticulture, Irrigation and Drainage Engineering, Irrigation Science, Physics, Physiology, Range Management, Sociology, Wildlife Management, and 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 your 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 may 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 foreign language is required. The particular language required will be that which best meets your needs. Requirements of a second language will be optional with the department in which you take your major. Your proficiency in using the required language in your chosen field and your knowledge of the grammar structure of the language will be determined by a committee

appointed by the dean of the School of Graduate Studies from members of the Languages department. The language examination should be taken before the beginning of the third year of study.

*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 your work, to determine your fitness for admission to candidacy for the degree of Doctor of Philosophy.

*Dissertation.* A completed dissertation approved by the department must be presented to the supervisory committee not later than May 1 of the year in which you 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 your dissertation will be conducted by the supervisory committee not later than two weeks before the date of commencement.

## 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 \$900 to \$1600 for one-third to one-half teaching service on a nine-month basis. Remuneration for research assistantships may vary from \$900 to \$2400, depending upon the time of service involved. Generally assistantships are arranged for your Master's degree in two years.

At present, assistantships are

available in the following departments: Animal Husbandry, Accounting and Business Administration, Agricultural Economics and Marketing, Agronomy, Art, Bacteriology and Public Health, Botany and Plant Pathology, Chemistry, Family Living and Child Development, Civil Engineering, Dairy Industry, Economics, Education, English, Entomology, Forest Management, Foods and Nutrition, Geology, Horticulture, History, Irrigation and Drainage, Instrumental Music, Mathematics, Modern Languages, Physiology, Physics, Physical Education, Psychology, Range Management, Sociology, Speech, Vegetable Crops, Veterinary Science, Wildlife Management, and Zoology. Research fellowships are available in: Animal Husbandry, Agricultural Economics and Marketing, Agronomy, Chemistry, Entomology, Irrigation and Drainage, Physiology, Range Management, Wildlife Management, and Zoology.

## Fellowships

*Nine University Research fellowships* carry a stipend of \$2,000 and the remission of non-resident tuition. The student is required to successfully participate 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 March 15, and awards are made April 1.

*National Defense Graduate fellowships* for the Doctor's degree are available in seven fields: Civil Engineering, Irrigation Engineering, Entomology, Physiology, Zoology, Botany, Plant Virology. They carry stipends of \$2,000 for the first year, \$2,200 for the second year,

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and \$2,400 for the third year, plus an allowance of \$400 per year for each dependent. Non-resident tuition is waived.

*Cooperative Fellowships.* USU participates in a Cooperative Fellowships program with the National Science Foundation. These fellowships carry a stipend of \$1,650 for a tenure of nine months, and \$2,200 for a tenure of 12 months, plus a

remission of fees. Deadline for application is November 1, and awards are made March 15.

### Tuition Scholarships

A number of tuition scholarships are available to beginning graduate students who are residents of Utah. Applications should be made to the dean, School of Graduate Studies. (Also, see catalog section on Scholarships.)

## Inter-Departmental Curriculum in

### Animal Nutrition and Biochemistry

ANIMAL NUTRITION, *L. E. Harris, J. E. Butcher, J. C. Street*; BIOCHEMISTRY AND PHARMACOLOGY, *D. A. Greenwood*; BIOCHEMISTRY, *H. O. Van Orden*; DAIRY NUTRITION, *G. E. Stoddard*; HUMAN NUTRITION, *E. B. Wilcox*; POULTRY NUTRITION, *C. I. Draper, J. O. Anderson*.

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. Included in the facilities are an animal metabolism building and equipment for conducting digestion and metabolism studies on large and small animals and several laboratories equipped with such equipment as an electron microscope, spectrograph, ultracentrifuge, electrophoresis apparatus, gas chromatographic equipment, as well as standard laboratory equipment.

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 should include at least one year or equivalent training in English composition, chemistry (including qualitative analysis, analytical, organic, and biochemistry) mathematics through trigonometry, physics, bacteriology, botany, physiology, and zoology. Any deficient prerequisite work must be completed without graduate credit.

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 con-

cerning admission, requirements, and available scholarships and fellowships write the curriculum chairman.

**Master's Degree Requirements**

	Credits
1. Advanced Nutrition.....	10
2. Advanced Biochemistry.....	10
3. Statistics .....	8
4. Physical Chemistry (Biol.).....	3
5. Electives and Research.....	14-17
Total .....	46-48

**Doctorate Degree Requirements**

1. Advanced Nutrition.....	12
2. Advanced Biochemistry.....	15
3. Statistics .....	12
4. Physical Chemistry (Biol.) .....	3
5. Physiology, Zoology, Pathology.....	20
6. Elective and Research.....	73
Total .....	135

Chairmanship for the curriculum rotates each year: chairman for 1960-61, J. O. Anderson; chairman for 1962-63, Lorin E. Harris.

Inter-Departmental Curriculum in

Plant Nutrition and Biochemistry

BIOCHEMISTRY, *H. O. Van Orden*; HORTICULTURE, *D. K. Salunke, D. R. Walker*; PLANT PATHOLOGY AND VIROLOGY, *O. S. Cannon, G. W. Cochran, G. W. Welkie*; PLANT PHYSIOLOGY, *G. W. Miller, H. H. Wiebe*; SOIL CHEMISTRY, *R. L. Smith*.

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 should include Botany (general and plant physiology), Chemistry (qualitative, quantitative, organic and elementary biochemistry), Mathematics (including one year of geometry and calculus) and Physics. Any deficiency must

be completed before an individual is accepted as a candidate for graduate degree.

**Master's Degree Requirements**

	Credits
Botany and Plant Pathology	
1 course (116, 117, 118, 125, 130, 150)....	3-5
1 course (121, 224, 225, 226).....	3-4
Chemistry	
2 courses (295, 296, 297).....	6
Instrumental analysis 153.....	4
Physical Chemistry 101.....	3
Seminar .....	2
Zoology	
Genetics 112 or Cell Physiology 130.....	5
Research .....	Maximum 15

**Doctorate Degree Requirements**

(in addition to those listed for M.S. program)

Botany	
2 courses (224, 225, 226).....	6-7
Chemistry	
Physical Chemistry 104, 105, 106.....	9
1 course (295, 296, 297).....	3
Instrumental analysis 273.....	3
Physics	
1 course (140, 143).....	3
Seminar .....	3
Research .....	Maximum 45







## *Summer School*

# Summer School

Gene S. Jacobsen, Director

Office in Agricultural Science 115

USU is situated on a hill overlooking beautiful Cache Valley. One mile to the east is the entrance to scenic Logan Canyon through which Highway 89 leads to Bear Lake and on northeast to Star Valley, Jackson's Hole and Yellowstone Park.

With its population of 19,000, Logan is an ideal place to combine study and vacation. The summer climate is unsurpassed. The evening canyon breeze makes summer nights comfortable and invigorating.

USU Summer School is organized to meet the diverse needs of administrators, supervisors, elementary and secondary teachers, guidance counselors, entering freshmen, people in the professions and vocations. In short, the major objective of the University is to foster all that makes right living, good citizenship, vocational efficiency, general culture and the improvement of our democratic way of life. Such values may be realized by participating in planned activities scheduled for one week, two weeks, one session or a full ten-week period.

The instructional services at the University are organized into seven colleges: Agriculture; Business and

June 13-August 25, 1961

First Session June 19-July 21

Second Session July 25-Aug. 25

Social Sciences; Education; Engineering; Forest; Range and Wildlife Management; Family Life; Humanities and Sciences; also a School of Graduate Studies. Through all of these colleges, it is the policy of the University to make available to students opportunities for a broad program of collegiate instruction including vocational, technical, scientific and liberal education.

You can effectively combine education and recreation on one of the most beautiful campuses in America, at a moderate cost. USU has a Summer School with a national reputation. It has a highly competent resident staff, plus visiting teachers and lecturers of national recognition. Its exceptional recreational and cultural opportunities include fishing, boating, hiking, canyon parties and family picnics in Logan Canyon, within three minutes of the campus. Weekend trips are scheduled to such beautiful spots as Bear Lake, Yellowstone Park, Grand Teton National Park, and the Bear River Migratory Bird Refuge.

**A 1961 Summer School Catalog will be mailed to you upon request.**

# *Branch Colleges*



## Branch Colleges

### College of Southern Utah, Cedar City

Division of Agriculture, Biology, Forest, Range and Wildlife Management  
Division of Air Science  
Division of Business and Social Science  
Division of Education  
Division of Engineering and Physical Science  
Division of Family Life  
Division of Industrial and Vocational Education  
Division of Humanities, English and Fine Arts

### Snow College, Ephraim

Division of Agriculture and Life Sciences  
Division of Business  
Division of Education and Social Science  
Division of Humanities  
Division of Industrial and Vocational Education  
Division of Physical Science and Mathematics

# Branch Colleges

In addition to seven resident colleges, a school of graduate studies and several other divisions located on the Logan Campus, Utah State

University includes two branch colleges—Snow College at Ephraim and the College of Southern Utah at Cedar City.

## College of Southern Utah

Daryl Chase, President

Royden C. Braithwaite, Director

The College of Southern Utah was founded in 1897 as Branch Normal School of the University of Utah and functioned as such until 1913 when it became a branch of Utah State University. For the next 40 years it was known as Branch Agricultural College. In 1953 the name was changed to College of Southern Utah.

Its affairs are under the immediate supervision of the Board of Trustees of Utah State University and administered by the President through a director who is responsible directly to the President of Utah State University.

*Location.* The College of Southern Utah is located at Cedar City in Southwestern Utah.

*Accreditation.* College of Southern Utah is accredited by the Northwest Association of Secondary and Higher Schools.

*Campus and Facilities.* The main campus of CSU consists of 60 acres of land and 21 buildings. In addition to its main campus the college includes 3,000 acres of mountain range land, a 1,000-acre valley farm, and numerous livestock sheds and buildings.

*Degrees and Certificates.* CSU is authorized to issue the certificate of Associate in Science, and by action of the Board of Trustees offers four years of work leading to the degree of Bachelor of Science in elementary education. This degree is awarded through Utah State University. Students who follow terminal curricula are awarded a two-year certificate of completion.

*Curricula.* CSU is authorized to teach lower division courses in all basic areas of instruction, and by action of the Board of Trustees, four years of work in elementary education.

Courses offered at College of Southern Utah parallel lower division courses offered at Utah State University. Course numbers generally coincide with those listed at USU. You may complete all lower division requirements at College of Southern Utah 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.



## 260 Branch Colleges

*For Information.* A special catalog for CSU is issued each year. It contains a detailed announcement of all curricula, statement of courses, entrance requirements, rules, and regulations for the college. For a copy of the CSU catalog,

or for information concerning the work of College of Southern Utah, address:

Director's Office,  
College of Southern Utah,  
Cedar City, Utah.

## Snow College

Daryl Chase, President

Floyd S. Holm, Director

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.

Its affairs are under the immediate supervision of the Board of Trustees of Utah State University and administered by the President through a director who is responsible directly to the President of Utah State University.

*Location.* Snow College is located at Ephraim, which is the geographic center of the state 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 30 acres and contains 12 buildings. In addition to the main campus, Snow College operates 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. You 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 regulations for the college. For a copy of the Snow College catalog, or for information concerning the work of Snow College, address:

Director's Office,  
Snow College,  
Ephraim, Utah.

## *Extension Services*

# Extension Services

## Administrators and Supervisors

DIRECTOR *Carl Frischknecht*; ASSOCIATE DIRECTOR *Gene S. Jacobsen*; ASSISTANT DIRECTOR *J. Clark Ballard*<sup>1</sup>; SUPERVISOR, HOME ECONOMICS PROGRAMS *Thelma Huber*; ASSISTANT SUPERVISOR, HOME ECONOMICS PROGRAMS *Jenniev J. Poulson*; STATE 4-H CLUB LEADER *Glenn T. Baird*; ASSISTANT STATE 4-H CLUB LEADER *Amy R. Kearsley*; DISTRICT SUPERVISORS *Gordon L. Beckstrand*, *Marden Broadbent*, *Stephen L. Brower*, *Lloyd R. Hunsaker*.

## State Subject-Matter Specialists

AGRICULTURAL ENGINEER *Wayne B. Ringer*; AGRONOMIST *Louis A. Jensen*; ANIMAL HUSBANDMAN *George R. Henderson*; CLOTHING SPECIALIST *Theta Johnson*; DAIRY MANUFACTURING SPECIALIST *A. J. Morris*; DAIRYMAN *John Barnard*; ENTOMOLOGIST *George F. Knowlton*; FARM MANAGEMENT SPECIALIST *John F. Vallentine*; HOME MANAGEMENT AND HOME FURNISHINGS SPECIALIST *Rhea H. Gardner*; HORTICULTURE AND VEGETABLE CROPS SPECIALIST *Anson B. Call*; INFORMATION SPECIALIST *Cleon M. Kotter*; LIVESTOCK MARKETING SPECIALIST *Morris H. Taylor*; NUTRITIONIST *Elna Miller*; POULTRY SPECIALISTS *C. Elmer Clark*,<sup>1</sup> *C. I. Draper*; RADIO AND TELEVISION SPECIALIST *Arthur L. Higbee*; RECREATION SPECIALIST *Clayne R. Jensen*; SHEEP AND WOOL SPECIALIST *Russell Keetch*; SOCIOLOGIST *William A. DeHart*; SOIL CONSERVATIONIST *Paul D. Christensen*; VETERINARIAN *Don W. Thomas*; WILDLIFE SPECIALIST *Jack H. Berryman*.

## County Agricultural Agents

BEAVER *Grant M. Esplin*; BOX ELDER *A. Fullmer Allred*, *Ray H. Finch*; CACHE *Lamont E. Tueller*, *G. Ray Burtenshaw*; CARBON *Robert L. Hassell*; DAVIS *L. Darrell Stokes*, *Lehi S. Rogers*; DUCHESNE *William L. Smith*; EMERY *Gerald R. Olson*; GARFIELD *Harold G. Lindsay*; IRON *Wallace D. Sjoblom*; JUAB *Kay R. Bendixson*, *Lynn M. Esplin*; KANE *D. Wayne Rose*; MILLARD *Rodney G. Rickenbach*, *Marven J. Ogden*; MORGAN *Ray A. Thatcher*; PIUTE *Rulon W. Buck*; RICH *Wesley T. Maughan*; ROOSEVELT *Norris J. Stenquist*; SALT LAKE *Joseph R. Parrish*; SAN JUAN *Rell F. Argyle*; SANPETE *C. Dennis Funk*; SEVIER *Paul R. Grimshaw*; SUMMIT *J. Reed Moore*,<sup>1</sup> *Lloyd A. Clement*; TOOELE *Ernest O. Biggs*; UINTAH *William F. Farnsworth*, *Ben W. Lindsay*; UTAH *Clair R. Acord*, *Joel C. Barlow*; WASATCH *Paul R. Daniels*; WASHINGTON *J. Keith Hughes*; WAYNE *Jay M. Hall*; WEBER *Melvin S. Burningham*, *Fay W. Boyer*.

## County Home Agents

BEAVER *Sofia Ann Yardley*; BOX ELDER *Bessie M. Hansen*; CACHE *Bessie K. Lemon*, *Jessie Eller*; DAVIS *Karma P. Swindle*; EMERY *Mary Ann Jorgensen*; GARFIELD *Flora H. Bardwell*; IRON *Mabel Merrill*; JUAB *Velyn B. Stevens*; MILLARD *LaVell W. Turner*; MORGAN *Margaret Hall*; PIUTE *Ruth D. Coates*; RICH *Helen J. Wamsley*; SALT LAKE *Bernice Palfreyman*, *Carolyn H. Dunn*; SANPETE *Sarah S. Tuttle*; SEVIER *Beth S. Bastian*; SUMMIT *Naomi Jensen*; TOOELE *Elizabeth Darley*; UTAH *Emily W. Tyler*; WASATCH *Mary R. Bacon*; WASHINGTON *Mary K. Purdy*; WEBER *Maud Martin*, *Ruth Tippetts*.

<sup>1</sup>On leave.

# Extension Services

Carl Frischknecht, Director

Office in Agricultural Science 120

Utah State University's Extension Services include the Cooperative Extension Service and Extension Classwork and Home Study programs.

## 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 farms and homes 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 27 subject-matter specialists comprise the staff at the state office on the USU campus. These staff members train, supervise and assist county agricultural and home agents and local leaders.

County Extension Agents are located in 27 of Utah's 29 counties. At present there are 37 agricultural agents, 22 home agents, and two consumer marketing agents.

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 improvement; (9) public affairs.

To train leaders and supplement the Extension work done by county 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 Agricultural Experiment Station and other groups.

## Extension Classwork and Home Study

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 home campus to register for resident courses. For this group, USU provides a liberal program of educational offerings, including Extension Classwork, Home Study and a number of other educational services fully accredited by the National University Extension Association.

### Extension Classwork

Organized courses in many departments of Utah State are offered in as many as thirty selected residence centers of the state for groups of people who cannot come to the home campus at Logan, but who desire professional improvement or who are interested in an advanced degree. Such courses are designated as *Extension Classwork*. They carry resident 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 "fifteen hours of on-campus rule," Extension classes may meet the requirements for a Bachelor's degree. Extension classes are also accepted to 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 appointed by the head of the department, with the approval of the University administration.

The registration fees charged for Extension classes conform to the prevailing regulations fixed by the Board of Trustees.

### Study Tours

USU conducts each year study tours to Mexico and other foreign countries, with or without credit. The instructor in charge of the tour is a regular faculty member, or some other individual approved by the head of the department and the dean concerned. You may earn as many as three to nine credit-hours for work done in connection with such a tour.

If interested in a study tour contact the University well in advance of the close of the academic school year, to meet specific assignments which are made by the department offering the credit. As applicant for a study tour you will need to cooperate with the head of the department in which credit is desired.

### Adult Education Services

USU offers a number of special services for adults in the field of education, including the following:

*Faculty Speaker Service.* The University provides a faculty speaker service for commencement exercises, teacher institutes, parent-teacher meetings, service organizations, and other adult groups which are concerned primarily with problems in public education. Copies of a *Faculty Speaker Service Brochure* may be had by writing to USU Extension Services.

*University Lecture Series.* USU provides each year a special lecture series dealing with such topics as the Great Religions, International Problems, and Current Problems in Education.

*Conferences and Institutes.* The

University cooperates with teachers, administrators, and boards of education in planning educational conferences and institutes in connection with in-service teacher, parent-teacher, and other group organization improvement programs.

## Home Study Courses

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 Home 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 generally, who desire general education and professional improvement in selected fields.

An enrollee must be at least 19 years of age, or submit fifteen units of high school work, or be a graduate of a high school for admission to Home Study courses of college grade.

One-fourth of the credits necessary for a Bachelor's degree (45) may be earned through the Home Study Courses. Each college of the University, subject to faculty approval, determines the nature and the amount of home study credit accepted for admission and graduation. In no case is more than 25 per cent of the total number of credit hours accepted for graduation to be Home Study credit.

**Graduation Deadline.** Seniors who plan to apply Home 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 Registrar's 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.

**U.S.A.F.I. Courses.** USU is co-operating with the United States Armed Forces Institute (U.S.A.F.I.) at Madison, Wisconsin, by providing Home 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 for Home Study courses should contact the education and information center at the base where he is located.

**Veterans.** USU is approved by the Veterans Administration to offer Home Study courses under the G. I. Bill of Rights. If you desire Home Study courses you should first contact your local Veterans Administration regional office and determine whether you are still eligible to continue schooling under the G. I. benefits, and if so, determine what procedures you must follow.

**Fees.** A fee of \$6 per credit hour is charged for Home Study courses of college level. High School course fees are \$18 per unit and \$12 per half-unit. All fees are subject to change.

**Home Study Catalog.** If you are interested in Home Study courses, request a Home Study Catalog, which contains full information concerning this program.







## *Information Services*

## Information Services

DIRECTOR OF INFORMATION SERVICES *LeRoy A. Blaser*; EDITOR OF UNIVERSITY PUBLICATIONS *John J. Stewart*; EDITOR OF AGRICULTURAL EXPERIMENT STATION PUBLICATIONS *Gladys L. Harrison*; UNIVERSITY NEWS EDITOR *J. R. Allred*; ATHLETIC NEWS EDITOR *Karl W. Klages*; AGRICULTURAL INFORMATION EDITOR *Courtney Brewer*; EXTENSION SERVICES INFORMATION SPECIALIST *Cleon M. Kotter*; CHAIRMAN OF UNIVERSITY RADIO AND TELEVISION *Burrell F. Hansen*; PRODUCER-DIRECTOR, KUSU AND KUSU-TV *Rey L. Barnes*; EXTENSION SERVICES RADIO AND TELEVISION SPECIALIST *Arthur L. Higbee*; UNIVERSITY PHOTOGRAPHER *Arlen L. Hansen*; DUPLICATING CENTER *Alexander Ruybal*.

### Office in Information Services Building

Good teaching, sound research and other practical services performed well are USU's chief means of public relations.

Being a public, tax-supported 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 journals.

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 publications include:*

(1) A monthly University Bulletin series, devoted to the University Catalog, Summer School Catalog, Home Study Catalog, Audio-Visual Aids Catalog, and to bulletins featuring the various departments and offerings of the University, and to research by the Division of University Research

and the Engineering Experiment Station.

(2) Brochures for conferences, workshops and other events.

(3) Extension Service Bulletins of an instructional type, in agriculture and homemaking especially.

(4) Agricultural Experiment Station Bulletins, reporting results of research.

(5) A Monograph Series featuring essays and lectures of USU faculty members.

(6) *Farm and Home Science*, a quarterly magazine of state-wide distribution, featuring research conducted by the University and its affiliated organizations.

(7) The *Alumnus* magazine, published nine times a year, containing news and features for USU Alumni.

(8) Student publications, including *Student Life*, a semi-weekly newspaper; *Scribble*, a yearly magazine, and *Buzzer*, the yearbook.

The Program Bureau of the Information Services provides educational program services to civic, community, and educational groups, including schools. This service consists of student and faculty talent.



## *Research Programs*

## Research Programs

*Division of University Research, 271*

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*Rocky Mountain Fisheries Investigations, 280*

# Research Programs

DIRECTOR, DIVISION OF UNIVERSITY RESEARCH AND OF AGRICULTURAL EXPERIMENT STATION, *D. Wynne Thorne*; DIRECTOR, ENGINEERING EXPERIMENT STATION, *Vaughn E. Hansen*; DEAN, SCHOOL OF GRADUATE STUDIES, *J. Stewart Williams*; CHAIRMAN, BUREAU OF EDUCATIONAL RESEARCH, *Walter A. Borg*; PRESIDENT, UTAH SCIENTIFIC RESEARCH FOUNDATION, *W. W. Lundberg*; LEADER, UTAH COOPERATIVE WILDLIFE RESEARCH UNIT, *Jessop B. Low*; CHIEF, ROCKY MOUNTAIN FISHERIES INVESTIGATIONS, *Norman G. Benson*.

Utah State University was among the first of the colleges and universities in the Intermountain area to have a research program. Originally the research was principally in agriculture. Now research projects are in every college and almost every department of the University.

*Research is closely associated with teaching and student activities.* Most of it is 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 Director of University Research. Actual research operations are in several organizations. The principal organizations and areas of research are as follows:

## Division of

## University Research

D. Wynne Thorne, Director

### Office in Agricultural Science 130

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 not associated with the Agricultural Experiment Station is administered under the Division of University Research. This research is supported by institutional funds and by grants from various private and public agencies.

*Policies on research and requests for support* are reviewed by the University Research Council. Present members of the Council and

the area each represents are: T. Y. Booth, Literature and Arts; Vernon L. Israelsen, Business and Social Sciences; Eldon J. Gardner, Biological Sciences; Jurgen R. Meyer-Arendt, Physical Sciences; Walter R. Borg, Education; Allen W. Stokes, Forest, Range and Wildlife Management; Ethelwyn B. Wilcox, Home and Family Living; Clayton Clark, Engineering and Technology; J. Stewart Williams, School of Graduate Studies, and D. Wynne Thorne, Research Division.



## 272 Research Programs

University research is especially devoted to developing the natural resources and the well being of people of the Intermountain area. Research is closely associated with teaching in that individual projects are conducted by members of the teaching staff with the aid of students. Some important areas of research and types of investigations under way include:

*Education:* Studies are being continued on the evaluation of ability grouping of students in elementary and secondary schools. A survey is being made to determine the benefits of optional summer school programs in secondary schools in Utah. Results are being tabulated on the use of a new drug to increase intellectual performance in College students. A new area in experimental psychology is being developed to use experimental animals to study development of basic habits and motives.

*Literature and Arts:* A novel has been completed and is in the hands of the publishers for consideration. A study is being conducted involving the basic areas in punctuation. A creative drawing program will culminate in a campus exhibit. A comprehensive collection of cowboy ballads recorded from individuals throughout western United States is being edited and annotated for publication.

*Biological Science:* A new study is being instigated on tissue eosinophil differentiation to better understand such hypersensitivity reactions as are being observed in allergies and in certain parasitic infections. Studies are continuing on fruit flies and their tumorous traits, and new equipment is being utilized to study the behavior of birds and recording their calls. The cytology of hybrids produced

by grasses of different species is being studied to further clarify evolutionary processes.

*Physical Science:* A research program in the general area of biophysics is receiving major attention. Studies are underway on the biological effects of radiation and x-ray spectroscopy. Research in chemistry is devoted to the structure of chemical compounds and the role of metal complexes in biological reactions. The mineral resources of the Sevier River Basin and the geologic structure of northern Utah are being studied.

*Social Science:* A history of Utah State University is being written in preparation for the Land Grant Centennial and Diamond Jubilee in 1962-63. A study is underway on the developments of the National Labor Relations Act after 25 years. Investigations are continuing on children's relationships with parents and others, and on the economics of acquiring and managing state lands for surface use.

*Engineering:* New electronic equipment is being developed for measuring and reporting by radio snow and other precipitation on watersheds. The dynamics and mathematics of water movement under various conditions are being reduced to basic principles. The properties of soil in relation to certain types of construction and in relation to ground contacts for electronic current are also receiving attention.

*Forest, Range and Wildlife Management:* A year-around field station is being established at Bear Lake where studies in environmental biology, limnology, zoology, geology, botany and hydrology may be conducted. Methods are being explored for obtaining improved utilization and increased carrying

capacity from mountain summer ranges. Studies on population dynamics of fish of Bear Lake, ecology and behavior of ground squirrels, ethology of North American quail are some of the points of interest. Research in forestry

deals with production and marketing of Christmas trees, with temperature effects on root growth of seedlings (conifer), and with a history of timber resource use in Cache Valley.

## Agricultural Experiment Station

William H. Bennett, Dean, College of Agriculture

D. Wynne Thorne, Director, Agricultural Experiment Station

### Office in Agricultural Science 136

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 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 125 professional staff members associated with 19 different departments of the University: Agricultural Economics, Agronomy, Animal Husbandry, Applied Statistics, Bacteriology and Public Health, Botany and Plant Pathology, Chemistry, Civil and Irrigation Engineering, Clothing and Textiles, Dairy Industry, Foods and Nutrition, Forestry, Horticulture, Poultry Husbandry, Range Management, Sociology, Veterinary Science, Wildlife Management, and Zoology, Entomology and

Physiology. The staff includes about 35 employees of the U. S. Department of Agriculture who are assigned to collaborate in agricultural research activities. A large number of undergraduate and graduate students are employed on a part time basis to assist with the studies.

The Experiment Station investigations are organized into about 170 research projects. Some of the areas of research include: 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; conservation of water and soils; gathering snow survey data and predicting

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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. 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 Science Building. Most of the research laboratories used by the Experiment Station are also on the campus, distributed among the various University buildings.

Greenhouses are maintained for investigations in horticulture, agronomy, botany, plant pathology, entomology, bacteriology and range management.

Livestock husbandry investigations are conducted at the barns on the University campus, and at the two branch campuses: the College of Southern Utah, at Cedar City, and Snow College at Ephraim; at the U. S. Forest Service Desert Range Station in Millard County; at the Benmore Experimental Range in Tooele County, and on the ranges in different parts of the state.

The Station maintains the following field stations staffed with one or more technically trained men:

*Howell Field Station for Horticultural Research*, located in Weber County, north of Ogden. This is a 71-acre tract of land plus laboratory

and storage buildings used for investigations in the production, harvesting, storage and marketing of fruit.

*Farmington Field Station at North Farmington*. This consists of 96 acres of land and a fruit and vegetable processing laboratory and is used for experimental work in horticulture, floriculture and vegetable crops.

*Snow Field Station* located north of Ephraim and operated cooperatively with Snow College. This is a 94-acre tract used for research and demonstration on crop production and dairying.

*Range Livestock Field Station* located in the vicinity of Cedar City and operated cooperatively with the College of Southern Utah. It consists of 1200 acres on the Valley Farm west of Cedar City, 2820 acres of summer range land east of Cedar City, and 7800 acres of leased winter range land near Modena. Breeding and management of range sheep and beef cattle are studied.

The Station also maintains the following experimental farms:

*Animal Husbandry Farm*, north of the campus, contains 362 acres of land used for pastures and feed production. Investigations include the breeding, nutrition and management of sheep, swine and beef animals.

*Cache Valley Reclamation Farm*, located northwest of Logan in the center of poorly drained pasture lands, consists of 115 acres. This is used for research on drainage and improvement of fine textured, water-logged lands.

*Dairy Farm*, at North Logan, includes 200 acres of land, barns, milking parlor and a house. The Station maintains an experimental

Holstein-Fresian and Jersey dairy herd of about 100 purebred animals. Pasture investigations are also conducted.

*Evans Farm*, a 42-acre tract located south of Logan, is used in cooperation with the U. S. Department of Agriculture for a study of improvement of forage plants. Special attention is given development of improved plants for irrigated pastures and for range lands.

*Greenville Farm*, a 46-acre tract two miles north of the campus, is used for experimental work in plant breeding and other phases of crop production.

*Nephi Farm*, on Levan Ridge in Juab County, is used for experimental work in dry farming and range seeding. This farm has 103 acres.

*Panguitch Farm*, north of Panguitch, consists of 150 acres of irrigated land with accompanying buildings. Crop production in high altitude areas and breeding of beef cattle are the principal investigations conducted.

*Poultry Farm*, in North Logan, is used for research on the breeding, feeding and control of disease in chickens.

*Turkey Farm*, a 33-acre farm just east of Logan, is used for studies in turkey breeding, nutrition, and disease control.

*Benmore area*, in Tooele County, consists of 3,500 acres of reseeded range pasture, and is used in cooperation with the U. S. Department of Agriculture for studies in management of range cattle and for research in range management.

*Washington County Fruit Plots*. About three acres of land near Hurricane are rented by Washington County. The land is used for variety studies of deciduous fruits as part of a program to improve the economy of Southern Utah.

The Station also conducts experiments on a cooperative basis with farmers and ranchers on more than 250 privately owned farms located in all parts of the state.

The research facilities have a three-fold importance in the institution: First, they make it possible for the teaching faculty to fortify instruction with the results of original research; second, they afford advanced students an opportunity to keep in touch with research methods and facilities; and third, they offer employment to students qualified to act as research assistants or laboratory aids. About 200 students thus employed are on Station payrolls each month of the school year. Several find employment in laboratories and on the experimental farms during the summer months.

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### USU Agricultural Experiment Station Field Days

Month	Event	Location
March	Performance testing of rams	Animal Husbandry Farm, Logan
May	Performance testing of bulls	Animal Husbandry Farm, Logan
June	Strawberry research	Farmington Field Station
June	Forage, dairying, turkeys	Snow College, Ephraim
July	Stone fruit virus	Farmington Field Station
July	Field crops research	Greenville Farm, North Logan
August	Dairy day	Dairy Farm, North Logan
August	Early fruit varieties	Howell Field Station, North Ogden
September	Canning crops research	Farmington Field Station
September	Flowers and ornamentals	Farmington Field Station
September	Late fruit varieties	Howell Field Station, North Ogden
October	Chrysanthemum day	Farmington Field Station
November	Animal nutrition research	Animal Husbandry Farm, Logan
November	Sheep breeding and management	Southern Utah Range Livestock Field Station, Cedar City

## Engineering Experiment Station

Dean F. Peterson, Dean, College of Engineering

Vaughn E. Hansen, Director, Engineering Experiment Station

### Office in Engineering 203

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, especially as these relate to improving the welfare of Utahns, through development of agriculture, industry, natural resources, and in development of methods of more effective engineering teaching.

The Station was established December 2, 1918, by act of the Board of Trustees. The director has su-

pervisory responsibility to the Dean of Engineering for all research conducted by the various departments of agriculture, industry, natural resources, and in development of methods of more effective engineering teaching.

*Important public service projects* being pursued by the Station include developments in control systems, machinery, fuel and power, computation methods, electrical power applications, electronic designs, and water supply, control and conveyance.

## Engineering Experiment Station 277

The Station conducts basic and applied research in civil, electrical, mechanical, tool and agricultural engineering. Emphasis is placed upon development of water resources and methods of water control and utilization. Typical subjects currently under study include highways, materials, hydraulics, servomechanisms, and radio propagation.

Staff members of the Civil, Electrical, Mechanical and Tool and Manufacturing Engineering Departments and the Industrial and Technical Education Department are staff members of the Engineering Experiment Station. Staff members may be employed full or part time on research. The Station cooperates closely with the Utah Scientific Research Foundation. All laboratories of the College of Engineering as well as the facilities of the Utah Scientific Research Foundation are available to assist in the execution of the projects of the Station.

Results of these studies are published in research bulletins, engineering reports and papers, or are otherwise made available to those interested.

Following are some the areas of current research in the Engineering Experiment Station:

*Foundation conditions for the interstate highway* across the salt flats near Wendover, Utah are being studied.

*Soil cement used as a subgrade* for highways, airports and shoulders for highways is being studied to determine its resistance to alkali and to obtain better design. Pozzolan and other additives are being placed in concrete to improve the quality not only of highways, but of runways and even basements and sidewalks.

*Water requirements of marsh-*

*lands* are being determined for the State Fish and Game Department.

*A survey has been made of pumping* from ground water in central Utah, and research is providing a better method of designing culverts.

*The basic processes involved in water use by plants* is being investigated. A new low-cost water level recorder has been developed for use by canal companies.

*Water shed characteristics* are being studied to arrive at better methods of predicting flood flows and runoff characteristics.

*Significant advances are being made in the hydraulics of surface irrigation.* Studies presently being conducted promise much better methods of handling and measuring water in steep and mountain streams.

*Low-cost prefabricated irrigation structures for farm use* are being designed. They can be readily assembled and installed by the farmer.

*Internal combustion engines and fuel* used for industrial power are the subject of intensive study to arrive at performance characteristics that can be used for field applications.

*Adjustment of automobile carburetors* to give better efficiency at various altitudes is an active project.

The Station is cooperating with the Utah Scientific Research Foundation in the development of *suspension and power-selector systems* for off-highway tracked vehicles.

*A method of evaluating the relative productive value of land* has been developed and a study is underway on the use of gravel envelopes and the general hydraulic characteristics of wells.



## 278 Research Programs

*New ultrasonic methods* are being developed for measuring sediment size and concentration in streams.

*Improved techniques for electro-fishing*, essential in fish management, are being developed.

*Projects are underway on transistors and antennas* as well as improving methods of grounding.

*Movement of ionization patches in the upper atmosphere* is being studied and new techniques are being developed for transmitting snow depth and water content information by radio out of the watersheds to central headquarters.

*Rocket design and behavior studies* are underway in cooperation with some of the prime defense agency contractors.

# Utah Scientific Research Foundation

W. W. Lundberg, President

### Office in USRF Building, on Campus

This is a non-profit corporation organized in 1944 as an affiliate of the Utah State University with the primary objective of encouraging scientific investigation. The Foundation conducts independent investigations and serves in the interest of the University in obtaining and developing patents, profits from which are dedicated to the support of further research at the University in the public interest.

Among the accomplishments of the Foundation are the development of a farm mower which eliminates the traditional Pittman rod; the design and production of a soil core sampling machine which has proved useful in soil and drainage investigations, and the development of a vehicle suspension and power selection system which has been incorporated into a snowmobile, which is in use by various public and private

agencies in the United States and Canada, and a number of units of which are used for transportation on the DEW (Distant Early Warning) Line in the Arctic.

The Foundation also serves departments of the University in the design and production of special precision apparatus, not available on the market, for use in research and teaching. In addition to the staff of the Foundation, technical assistance is given by faculty members from various departments.

The Board of Directors and officers of the Foundation are: Wilford W. Lundberg, President; Daryl Chase, President of the University; Dee F. Wangsgaard, Hubert C. Ward, Ernest G. Earl, Blaine W. Hancey and Ray E. Dillman, Directors; James A. Hardman, Project Director; and J. LeMar Larsen, Secretary-Treasurer.

School of

## Graduate Studies

J. Stewart Williams, Dean

**Office in Main 182**

Each year at Utah State University nearly two hundred students complete their work for an advanced degree. These degrees include the Master of Business Administration, Master of Education, Master of Forestry, Civil Engineer, Irrigation Engineer, Master of Science, 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. Abstracts of all theses completed during the past year are published, in one volume, at commencement time. Ofttimes, 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.

Bureau of

## Educational Research

John C. Carlisle, Dean, College of Education

Walter R. Borg, Chairman, Bureau of Educational Research

**Office in Main 82-A**

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.

## 280 *Research Programs*

### Utah Cooperative

# Wildlife Research Unit

J. Whitney Floyd, Acting Dean, College of Forest, Range  
and Wildlife Management

Jessop B. Low, Leader, Utah Cooperative Wildlife Research Unit

### **Office in Forestry 301**

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, 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 high ranking candidates of institutions in wildlife management, zoology, botany, fish and related fields.

### Rocky Mountain

# Fisheries Investigations

Norman G. Benson, Chief; Ross V. Bulkley

**Office at 41 South Main Street, Logan**

The Bureau of Sports Fisheries and Wildlife has maintained a station at Utah State University since 1953 known as the Rocky Mountain Fisheries Investigations. Purpose of this research group is to study the factors affecting the fisheries of waters on public lands.

At present the investigators are

concerned with the waters of Yellowstone and other national parks. Professional biologists study mortality, creel harvest, growth rate and other phases of the fishery of national parks and waters of other public lands. During the summer, wildlife management students assist in this research program.



## *Student Services and Activities*

## Student Services and Activities

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# Student Services and Activities

DEAN OF STUDENTS *J. Elliot Cameron*; DEAN OF WOMEN *Leah Dunford*; COORDINATOR OF STUDENT ACTIVITIES *Evan Stevenson*; COORDINATOR OF STUDENT HOUSING *William W. Skidmore*; COORDINATOR, COUNSELING AND TESTING *Ronald Peterson*; CHAIRMAN, STUDENT HEALTH SERVICES *Gus W. Neece*; CHAIRMAN, STUDENT EMPLOYMENT PLACEMENT *John Davis*; CHAIRMAN, STUDENT LOANS *William E. Watkins*; CHAIRMAN, SCHOLARSHIPS, AWARDS, AND HONORS *J. Elliot Cameron*.

## Office in Main 133

The program of student services is designed to assist you in becoming effectively adjusted to University life. 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; admissions counseling; orientation activities; registration and records; personalized advisement and counseling services; directed organization activity; 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 part-time 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. 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.

The Office of Student Services invites inquiry from prospective students and those on campus who wish to obtain information and as-

sistance with personal needs or out-of-class activities.

## Religion

Separation of Church and State does not dictate a separation of Religion and Education. To be complete, education must include religious education.

LDS, Protestant, and Catholic churches offer courses in religion for USU students. You can receive credit at USU for all University accredited non-sectarian courses successfully completed at any of these churches. Any such courses taken are considered a part of your maximum academic load at USU.

In addition to formal course work, these churches provide religious services, personal counseling, and a program of social activities especially designed for students.

USU is interested in the spiritual and moral growth of all students. You are encouraged to affiliate with the church of your choice.

## Housing

Residents must be regularly enrolled students at Utah State University. (Costs subject to revision)

## Supervised Living Accommodations for Single Women

All freshman women not living



## 284 Student Services and Activities

at home must live in University-supervised housing. In rare instances, special permission may be granted by the Supervisor of Women's Housing to live with other close relatives when a letter of explanation is written by the parent or guardian of the freshman woman at least one month before the opening of school.

**A p a r t m e n t-Living Residence Halls** will accommodate six women to 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. Cooking utensils, dishes, towels, linens, bedspreads, irons, ironing boards for use in apartments, and all other personal effects are to be furnished by the renters. Cost of electricity used in the apartment is shared by the occupants. Telephones may installed if desired, also on a share-the-expense basis. Rent is \$70.00 per person per quarter. Living rooms, recreation and sewing rooms, sun decks, and laundry rooms are shared. The University provides coin metered washing machines. Ample storage space is provided.

A Conventional Board and Room Residence Hall will accommodate 100 women, two to a room. Linen changes, bedding, study desks, lamps, and utilities are furnished. The University provides coin metered washing machines. Towels and other personal effects are not furnished. Cost of \$210.00 per quarter covers board and room charges. Twenty meals per week are provided in the Student Union Cafeteria. Cost of room without board is \$85.00 per quarter.

Cooperative Houses on campus provide for excellent group living

experience for 22 upper-class students who share living expenses and housework. Cost for rent including heat and water is \$50.00 per person per quarter. Other utilities are not provided.

Sorority Houses provide board and room for their members and are managed by their own officers. Each has a mature housemother in a supervisory capacity approved by the Office of Student Services. Rates are determined by the house manager and compare favorably with other living rates on campus.

### Supervised Living Accommodations for Single Men

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 Student Union Cafeteria. Linen changes, bedding, study desks, lamps, and utilities are furnished. Towels and other personal effects are not furnished. A cost of \$210.00 per person per quarter covers board and room charges. Cost of room without board is \$85.00 per quarter.

Fraternity Houses provide board and room for their members and are managed by their own officers. Rates are determined by the house management and compare favorably with other living rates on campus.

### Living Accommodations for Married Students

University Apartments, (Prefabricated Units) 304 in number, located on the east fringe of the campus are within easy walking distance of the campus proper. They are combination living-room-kitchen-study arrangements with bedroom, bathroom and clothes

closets. These units can be rented furnished, unfurnished, or partly furnished with rent ranging from \$30 to \$32 per month. Electricity, cooking utensils, bedding, electric refrigerators, washing machines, dishes, window curtains, and other personal effects are not furnished. Apartments are provided with centralized hot air space heat, and electric rangette for cooking. A central laundry room is available to each set of 28 apartments.

*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. Parking space is hard surfaced. A utility house provides laundry space, also rest rooms and individual shower stalls. The University provides coin metered clothes washing machines and dryers. No provision is made for use of privately-owned laundry equipment. Monthly space rental per trailer home is \$18.00.

### Off-Campus Housing

The Office of Student Housing maintains lists of accommodations for students in private homes. 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 had in the Student Union Cafeteria on campus for about 65¢. This arrangement costs an off-campus student about \$75.00 per month. Sleeping rooms range from \$15 to \$25 per month for a single room, and \$30 to \$60 per month for apartments.

### Application for Housing

Prospective students are invited to direct their applications and inquiries to Co-ordinator of Student Housing, Utah State University, Logan, Utah. A \$25 application fee is required when applying for University-owned housing. Priority lists are based on date of application. Students desiring off-campus housing may procure the current housing list upon arrival at the University, Room 130, Main Building.

### Housing Regulations, Procedures

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 \$1.00 late fee plus 10¢ per day thereafter is imposed. The \$25 fee is forfeited if (a) notice of withdrawal from University housing is made after August 1, or (b) a student moves from the assigned hall prior to the end of the period covered by the agreement.

Dogs, cats or other similar pets are strictly forbidden within the University Housing area. Very few private home owners permit pets.

### Food Services

Food service is obtainable in the University Cafeteria located in the Student Union Building on campus.

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Monday through Friday schedules and approximate costs are: Breakfast 7:30-8:15 a.m., 50-65¢; Lunch, 11:30 a.m.-1:00 p.m., 65-85¢; Dinner, 5:30 p.m.-6:30 p.m., 75¢-\$1.00. Saturdays and Sundays, Breakfast 9:00-9:30 a.m., Lunch, 12:00 p.m.-1:00 p.m. The snack bar operates 8:00 a.m.-10:00 p.m., Mondays through Fridays and 12:00 to 11:30 p.m. Saturdays. 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.

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 applying for scholarships and other awards may obtain information from the office of Student Services, Room 133, 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)

**The Johansen Scholarship Fund** of \$5,000, a gift of the late Mrs. Johana Johansen, provides scholarships annually, worth in the aggregate from \$125 to \$150, for help of worthy students of junior and senior rank.

**The Lieutenant Clyde Parker Baugh Memorial Fund** of \$10,000, a gift of Mr. and Mrs. Wilford F. Baugh, provides four scholarships annually for deserving students of high scholarship and leadership.

**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.

**The 1927 Class Gift to the College** yields an annual income sufficient to provide two 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.

**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. The present value of the scholarship is \$500. 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.

**West Coast Electronics Manufacturers Association Scholarship Awards.** Several WCEMA awards of \$200 each are made each year to junior and/or sophomore Electrical Engineering students based on high scholarship and need.

**First Security Foundation.** Two scholarships of \$500 each awarded to students of business and finance at the end of their sophomore year.

**Louise Y. Robison National Woman's Relief Society Scholarship.** A gift of \$5,000 from the General Board of the National Woman's Relief Society has established a perpetual fund, the annual earnings from which are available for Latter-day Saint women majoring in Social

Work, or, as graduate students, majoring in Sociology with a special interest in the family or some field closely related to Social Work. The scholarship is in the amount of \$100 for undergraduate students and \$200 for graduate students. Undergraduate preference is given to seniors, although juniors are eligible, and are encouraged to apply. Application should include a transcript of credits, and two letters of recommendation, one of which must be from the Ward Relief Society President of the ward in which the student lives.

**Joseph A. Geddes Scholarship.** Limited to graduate students in sociology. The initial \$5,000 of this fund was contributed by students, friends and cooperatives. The Utah Cooperative Association in tribute to Dr. Geddes's services for cooperation contributes yearly the annual earnings from \$2,000. This scholarship provides an annual stipend of \$200. The award is made on a two-fold basis of high scholarship and character excellence. The Sociology staff is responsible for: (a) adding to the fund each year earnings in excess of the stipend, (b) aiding students to select projects useful to society, (c) supervising studies that emerge and their publication. Should the thesis or paper issuing require more than one year for completion the scholarship may be renewed for a second or a third year.

**The Phi Upsilon Omicron Scholarship** of \$25 is given annually by the Kappa Chapter of that organization to the freshman girl in the College of Family Life ranking highest on the following points: (a) scholarship; (b) participation in student activities; (c) service and cooperation; (d) leadership; (e) moral character; (f) judgment and reliability. The candidate must be a member of the Home Economics Club.

**Danforth Summer Fellowship.** 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 near by and two weeks leadership training at the American Youth Foundation Camp on Lake Michigan.

**Danforth Summer Scholarship.** 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.

**Rolla M. Rich Memorial Scholarship.** An award of \$50 to an outstanding student in agriculture in the upper division, who is active in the LDS Church.

**Borden Agricultural Scholarship.** An award of \$300 to a senior in Agriculture who has completed two or more courses in Dairy In-

dustry and has achieved the highest average grade among the students in Agriculture in all college work preceding the senior year.

**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.

**Ralston Purina Scholarship.** An award of \$500 given in recognition and assistance to an outstanding junior in Agriculture for use in his schooling the senior year.

**Jenkin Jones Memorial Award.** An award of \$500 given to an outstanding upper division student in Agronomy. Available for school expenses the following year.

**Virginia Dare Award.** A cash award of \$25 to the outstanding junior in Dairy Manufacturing.

**Swift and Company Award** to a student in Agriculture who is winner of an essay contest on livestock marketing. This award provides an expense paid trip of about one week to Chicago in early spring to study marketing of livestock and livestock products.

**Sears-Roebuck Foundation Awards** for Freshmen. Eighteen awards 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 Award for Sophomore.** An award of \$300 to the student in Sears-Roebuck Foundation Award for Freshmen, had the highest grade point average the freshman year. Available for school expenses for sophomore year.

**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.

**Utah Feed Manufacturing & Dealers' Association Scholarship.** An award of \$100 to an outstanding senior with a major in some phase of Animal Industry, preferably one interested in animal nutrition.

**J. Fish Smith Scholarship.** 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.

**Danforth Foundation Home Economics Fellowships.** The first is awarded jointly by the Danforth Foundation and the Ralston Purina

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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 home economics. The award provides two weeks' leadership training at the American Youth Foundation Camp.

**Chi Omega Fraternity Scholarship** of \$25 is awarded 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.

**Associated General Contractors Scholarship Award.** A gift of the Intermountain Chapter, A. G. C., provides a scholarship grant of \$200 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 A. G. C. and the Civil Engineering Department. Applications for the succeeding year must be filed with the dean on or before April 1.

**The Eric W. Ryberg Memorial Scholarship in Commerce,** sponsored by Eric C. and Mari-dean M. Ryberg, is awarded annually to a junior, senior, or graduate student in College of Business and Social Science (preferably one majoring in Business Management). The award is made on the basis of scholarship, character, personal interest in and adaptability to the field of Business Administration, and need. This scholarship carries a stipend of \$200.

**The American Society of Tool Engineers Awards.** 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 the Tool Engineering Department, USU, not later than February 10, each year.

**Deseret News and Salt Lake Telegram Professional Internship.** The News & Telegram 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.

**Cache Valley Chapter of the Utah State History 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.

**Jean H. Alleman Memorial Scholarship.** A two hundred dollar cash award based on scholarship, enthusiasm, and prospects for success in the field of retailing.

**Phi Kappa Phi Scholarship Award.** A one hundred dollar cash award given to a sophomore student of high scholarship and outstanding character.

**Greaves Memorial Scholarships.** Two seventy-five dollar cash awards in memory of Drs. Joseph E. and Ethelyn O. Greaves for students who have achieved in the fields of Science and Home Economics.

**Moen Memorial Scholarships.** Two cash awards of one hundred twenty-five dollars each in memory of Johanna Moen given to worthy students in the College of Family Life who show outstanding aptitude in the field.

**Sears Roebuck Foundation Award in Home Economics.** An award of \$200 given to a freshman student in the College of Family Life who has a high scholastic standing, leadership ability, and promise of achievement.

**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.

**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. Mr. Cardon and Mr. Neuberger established their business forty-five years ago. Their success is in large degree attributed to their ability in human relations both between each other and with their thousands of customers. The present management wishes to recognize this aspect of business and personal life. Applicants majoring in the fields indicated should contact the Dean of Business and Social Sciences.

**Soroptimist Scholarship.** A scholarship in the amount of \$125 is awarded by the Logan Soroptimist Club to a non-resident woman student of junior or senior standing who has attended Utah State University for one or more years and who shows evidence of scholarly attainment, industry, leadership, natural ability and talent.

**John A. Widtsoe Memorial Scholarship.** One graduate scholarship of \$500 will be available to an outstanding senior to pursue graduate study; one scholarship of \$200 will be given to an outstanding junior; and one scholarship of \$200 will be presented to an outstanding freshman. All who receive scholarships must use the monies in University work the coming school year. Checks will be sent to them following registration in the fall term.

## Awards and Honors

(presented principally to students already enrolled)

**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.

**Alpha Zeta 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.

**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.

**The Ogden Union Stockyards Challenge Cup.** Awarded each year to the student who shows the most proficiency in judging beef cattle.

**The Hawaiian Steamship Company's Challenge Cup.** Awarded each year to the student who shows the most proficiency in judging wool.

**The Salt Lake Union Stockyards Company Challenge Cup.** Awarded each year to the student who shows the most proficiency in judging hogs.

**The John K. Madsen Challenge Cup.** Awarded each year to the student who shows the greatest proficiency in judging sheep.

**Home Economics Awards.** Certificates of merit are conferred annually upon senior women in Home Economics adjudged by faculty and seniors upon the following basis: (a) application of Home Economics ideals to daily living, 50 points; (b) leadership in class work and other activities, 50 points. The number of awards shall not exceed 5% of the total graduating class. Candidates shall have a grade point average of three or better.

**A. S. C. E. Membership Award.** Junior Membership in the American Society of Civil Engineers, is awarded by the Intermountain Section, A. S. C. E., 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.

**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.

**Engineering Faculty Award.** Junior Membership in the A. S. C. E. or A. S. A. E. awarded by the Engineering Faculty to a graduating senior in Engineering on basis of scholarship, and promise of success in engineering. Selection is made by the Engineering Faculty.

**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.

**A. S. C. E. Student Chapter Award.** Junior Membership in A. S. C. E. 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



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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.

**Colonel Joe E. Whitesides 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.

**The American Legion Military Medal**, a gift of the Logan American Legion Post, 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 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 Utah State University Science Medal**, a gift of the late Director Emeritus William Petersen, 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.

**Merck Award.** Merck and Company, manufacturing chemists, award annually a copy of the Merck Index to an outstanding student in organic chemistry and biochemistry.

**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.

**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.

**Scholarship A's** in the form of gold pins 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.

**Alpha Kappa Psi Scholarship Award.** Alpha Kappa Psi Fraternity, Alpha Theta Chapter of which is established at the 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 College.

**Alpha Kappa Psi Scholarship Award.** Alpha Kappa Psi Fraternity, Alpha Theta Chapter of which is 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.

**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 bases for the award.

**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.

**Faculty Women's League Scholarship Award** is awarded to senior women and is 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.)

**Faculty Women's League Democracy Award** 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 interests to what seems to be the common good. (University award winner excluded.)

**Business & Professional Women's Scholarship.** A \$100 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.

A **University 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:

(a) The potential vocational or professional efficiency of the student as shown by his scholarly attainment, industry, natural ability and talent (50 points): and

(b) 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** is also conferred annually upon the woman student of the Institution who shows evidence in greatest measure of (a) potential vocational or professional efficiency as shown in scholarship, industry, and natural ability (50 points); and (b) womanly qualities, development of the social graces, not necessarily social prominence, and attitude of mind (50 points).

### Scholarships and Grants-in-aid (primarily for new students)

The University grants annual 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.

The University also awards grants-in-aid to help deserving students who have economic need.

To be eligible for a grant-in-aid, an athlete 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 Scholarships, 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 Scholarships.** The President of the University is authorized by Title 53, Chapter 34, Section 1-a, Utah Code Annotated, 1953, to waive registration and tuition fees in full or in part for a limited number of meritorious or impecunious students whose domicile is in the state of Utah.

**Logan Kiwanis Club.** Three \$100 scholarships awarded to outstanding students who are in need of financial assistance.

**Logan Lions Club.** Three \$100 scholarships awarded to outstanding students who are in need of financial assistance.

**Logan Rotary Club.** Three \$100 scholarships awarded to outstanding students who are in need of financial assistance.

**Palmer Scholarships.** Mr. and Mrs. Val W. Palmer made a gift of \$10,000 as a scholarship fund. Ten scholarships of \$100 each are awarded each year to students of outstanding scholarship and leadership ability.

**Home Economics Scholarship.** The faculty of the College of Family Life awards one \$100 scholarship to a high school graduate who shows special interest and ability in the field of home economics.

**Faculty Women's League Annual Freshman Scholarship** provides tuition for one year for a

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freshman woman. Selection is based on need, scholarship, and leadership.

**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 U.H.S. at Vernal.

**Carl Raymond Gray 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, Washington, Weber.

**Standard Oil Scholarships.** The Standard Oil Co. of California offers five scholarships to 4-H Club members in Utah as follows: \$350, 1st; \$300, 2nd; \$250, 3rd; \$250, 4th; and \$200, 5th; also five scholarships to FFA members.

**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.

**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.

**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.

**Fine Arts Talent Awards.** The Intermountain Theatres and Utah State University Fine Arts Department sponsor a Fine Arts Film Festival. Twenty per cent of the proceeds are placed in a special talent award fund. Regular \$100 scholarships are available for talented students regardless of their native state. Students interested should make formal application to the Department of Fine Arts and make arrangements for musical or theatrical auditions or submit a portfolio of art work. Students receiving these awards agree to remain active in their creative art specialty while at Utah State University. They need not major in field of specialization for which

the award is given, but this is strongly recommended.

**Intercollegiate Knights Scholarship.** Two \$100 scholarships are awarded to two freshman single male students of high scholarship and outstanding leadership ability who are not residents of the state of Utah.

## Loans

**Long Term Loans:** Utah State University participates in the National Defense Student Loan Program. Loans are made available to full-time, needy students who are progressing satisfactorily toward a degree. Ordinarily, a grade-point average of 2.5 is required for former students; or the student should be in the upper half of his graduating class for high school graduates. 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. 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 except for graduating seniors.

Individual financial problems may be discussed with the Chairman, Student Loans, Main Building, Room 102.

The total Student Loan Fund is composed of the following individual loan funds generously contributed by friends of USU:

**USU Faculty Women's League.** A loan fund for women students. Loans may range from \$50 to \$150. Preference is given seniors.

**USU Faculty Women's League Revolving Loan Fund** 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** 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** provides loans up to \$200, usually for one year, to deserving students in the School of Forest, Range and Wildlife Management. Application is made to the Dean's Office.

**Bureau of Land Management Loan Fund** provides loans up to \$100 to deserving students in the College of Forest, Range, and Wildlife Management. 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 student body 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** available to senior engineering students only. Application is made in the College of Engineering.

## Employment Placement

**Employment.** The office of Student Employment Placement assists students who are capable of carrying an academic load and need to supplement regular income through part-time employment. Students' wives are also assisted in obtaining positions on and off campus.

All students and students' wives desiring campus employment must register with this office and be appropriately cleared before being hired. An undergraduate student within the colleges of the University 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.

To extend off-campus services, the University has established a cooperative arrangement with the Logan Branch of the Utah State Employment Service. Requests for information on employment should be addressed to Chairman, Student Employment Placement.

Students from foreign countries must obtain a work permit before they may receive employment. Such permits may be acquired from the Foreign Student Advisor, Main 133, or the Immigration and Naturalization office in Salt Lake City, Utah.

Students under eighteen who find employment must obtain a work permit. These are controlled by the Logan City Board of Education.

**Placement.** The Employment Placement Office assists all seniors and post-graduates to obtain employment. Private employers, as well as governmental agencies, coordinate their recruiting programs through the Employment Placement Office.

The University is a member of the National Placement Association which lists many placement opportunities for the graduating student.

Further information is available in the Office of Student Employment Placement, Room 22, Student Union Building.

## Counseling

In recognition of the fact that you and other students are faced with many problems throughout your University career, a broad program of counseling services has been established to meet your individual needs in making and maintaining satisfactory adjustments to the University and life.

Under the supervision of the Co-

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ordinator of Counseling Services, the counseling program provides for all students the following services: (1) counseling with educational, vocational, personal, and marital problems; (2) individual and group testing; (3) occupational and educational information; (4) assistance with study skills; and (5) faculty advisement in each of the departments and colleges of the University.

The University strives to give you the assistance you need and desires to help you make wise decisions regarding your educational, vocational, and personal problems. Accordingly, at the time of admission to the University, you are assigned a faculty adviser with whom you will meet and have opportunity to discuss your academic program. If you live in a residence hall you are also invited to seek your residence counselor, who is in a position to assist you with many types of problems or to refer you to the person who can be of most help.

When you have problems requiring the help of specialized counselors, you will be referred by faculty advisers, teachers, and residence counselors to the office of the Coordinator of Counseling Services. You are also encouraged to request these counseling services directly through the counseling office whenever you have problems with which you would like help. Professional counseling is available, on a limited basis, in such problem areas as speech, study skills, religion, personal and social adjustments, emotional conflicts, courtship, and marriage.

*Guidance tests* related to your achievements, abilities, interests and adjustment are also available upon request. Although certain basic tests are given to all new

lower division students not having taken them while in high school, upper division students as well may avail themselves of this information. The data from these tests are used as a basis for counseling. If you have not decided upon a course of study you are especially encouraged to seek such information and assistance. If you wish to change from one college of the University to another you must clear with the Counseling Service before such a change may be made.

A file of current occupational literature dealing with job facts and labor market trends in most occupational fields is maintained in the Counseling Service and is available to you. Counselors help students use this information to investigate and appraise occupations in which they might have an interest.

A close relationship with community and state agencies is maintained so that when you need services not provided by the University you can be helped in obtaining such services by referral to these other agencies.

### Health

A health service is provided for all registered students on the campus at the Student Health Center located in the Union Building. Facilities consist of reception, consultation, examining and treatment rooms. The staff consists of one full-time physician, two registered nurses and a receptionist. Services are limited to such care as that customarily rendered in a doctor's office.

(1) A medical examination is required of all new students.

(2) The examination should be performed by a private physician



of the student's choice and should be accomplished prior to arrival on campus.

(3) New students are encouraged to have their family doctor perform the examination and report on a form provided by the University.

(4) It is highly recommended that students purchase the Voluntary Student accident and sickness Insurance available to them.

A general type of medical care is provided within the limitation of existing facilities under supervision of the university physician.

(1) The following services are available to eligible students without extra cost:

(a) Medical care for minor illnesses.

(b) Medical advice as to the need of further consultations and specialized treatment in the more difficult problems beyond the scope of the Health Service.

(c) Office care for minor emergencies.

(d) Initial care and first aid treatment for serious emergencies.

(e) Inoculations and immunizations.

(2) The service does not include:

(a) Treatment for emergencies occurring off campus.

(b) Treatment for chronic illness originating before entrance to school.

(c) Hospital care for any condition.

(d) Surgery.

(e) Medical care for wives or children of students.

(f) Definitive treatment for fractures, other types of injuries or illnesses of a more serious nature which require specialized types of treatment.

(g) X-ray examinations.

(h) Laboratory tests.

(i) The costs of drugs or medicine ordered on doctor's prescriptions.

(3) House calls will be made by the University physician during doctor's office hours, if requested at the health center and when circumstances justify precedence over office patients waiting to be seen. House calls also will be made at a charge of \$2 per call, after office hours by the University physician, when available and when a genuine emergency situation exists.

(4) In case of illness or emergency during office hours call: USU Student Health Service, Telephone SK 2-4100 Extension 435. After hours call: The University physician at his residence, telephone SK 2-2240, or a private physician of the student's choice. If neither physician is available at the time, and the emergency is of an urgent nature, report directly to the Logan LDS Hospital for necessary care. The student not covered by insurance should be aware of the fact that the service of a private physician as well as those of the hospital will be at his own expense.

(5) Office hours

The Health Center will be open from 8:00 a.m. to 5:00 p.m. Monday through Friday.

Doctor's hours are: 9:00 a.m. to 12 noon; 1:30 p.m. to 4:30 p.m.

## Orientation

A program of activities has been designed to acquaint you 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 in-



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struction in traditions, policies and procedures, there are opportunities for pre-registration 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 less than 96 quarter credit hours, is required to take certain standardized tests, unless such tests have been taken at the school last attended. The results are used by faculty and counselors to assist in placement and as guidance aids. For example, credit for Basic Communications is dependent upon information obtained from the Cooperative English test which is required of all new, lower-division students.

### Foreign Student Advisement

Students from outside the United States are provided with counseling assistance. A member of the staff is assigned to advise all students from abroad concerning problems of adjustment to University life. Through him students are referred to appropriate agencies and individuals on campus and elsewhere for further assistance. Further information may be obtained from Student Services Information, Room 133, Main Building.

Foreign students will obtain additional help from the Office of Admissions and Records in matters of acceptance and admissions, registration, withdrawals, reports to the Immigration Service and "ex-

tensions of stay" in the United States.

All students from abroad are invited to participate in activities sponsored by the Cosmopolitan Club. This organization has a membership of students and townspeople from America and foreign lands and promotes numerous activities fostering international friendships.

### Speech Clinic

The Speech Clinic provides help for persons having speech handicaps. The services of the speech clinic are available to any student. The types of problems handled include stuttering, delayed speech development, lisping and other articulation disorders, cleft palate speech, paralytic speech, "nervous" speech conditions, nasal speech, voice quality deviations, etc. All University students who have defective speech should register for Speech 75, Remedial Speech. Time and credit are arranged. The instructor is available for individual consultation, Main 79.

### Helpful Courses

Several courses are taught especially to help you with such personal affairs as marriage, food, clothing, and finances. Description of these courses is found in the departments offering them. They include: *Preparation for Marriage and Family Living*, FL&CD 20; *Early Childhood*, FL&CD 67; *Personal Finance and Consumer Problems*, BE 85; *Nutrition and Food Management*, F&N 9; *Basic Clothing Construction*, C&T 8; *Clothing Selection* (for men) C&T 15; *Home Management*, HA 149.

## Student Activities

You are encouraged to participate in one or more of the following activities, dependent upon your available time and academic load:

(1) *Intercollegiate Athletics.* USU's Intercollegiate Athletics program compares favorably with the programs of leading institutions throughout the nation. As a member of the National Collegiate Athletic Association, and the Mountain States Athletic Conference, Utah State University guides its intercollegiate program by the policies and regulations of those organizations.

The University became a member of the Mountain States Athletic Conference—otherwise known as the Skyline Conference—February 28, 1914. Other institutions in the Conference are the Brigham Young University, Colorado State University, Denver University, University of Montana, University of New Mexico, University of Utah and University of Wyoming.

USU's physical facilities for intercollegiate athletics include Romney Stadium, with a 9,000-spectator capacity; George Nelson Fieldhouse, with a 6,000-capacity basketball arena; a new baseball diamond, tennis courts, swimming pool, and running track. Major sports are football, basketball, baseball, and track. Minor sports are wrestling, swimming, skiing, tennis, and golf.

To be eligible for participation in varsity intercollegiate competition, you must maintain at least a "C" average in a minimum of thirty-six quarter credits in the three quarters immediately preceding the quarter of proposed participation. Generally, the same rule

applies to participation in freshman sports.

General supervision and direction of athletics for men is vested in the Director of Athletics. An Athletic Council consisting of the President of the University, the Athletic Director, five members from the University faculty, an Alumni representative, an A-Men representative, and three student-body officers, exercise faculty control of athletics.

(2) *Intramurals.* This program includes all seasonal sports for which awards are given.

(3) *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.

(4) *Theatricals.* Numerous productions are staged each year by student groups. Students participate in the lighting, staging, directing, and managing, as well as the acting.

(5) *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.

(6) *Student Publications.* Students publish a semi-weekly paper, *Student Life*, a yearbook, *The Buzzer*, and a literary magazine, *Scribble*; *Blue Book*, the official student handbook which contains the Student Directory, available to

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all regularly registered students. Some campus organizations sponsor publications of their own such as the Forestry Club's *Juniper*, and *Vapor Trails*, a monthly Air Force ROTC newspaper published by Arnold Air Society.

(7) *Radio Station KUSU*. The University operates an FM radio station which provides four hours of radio programs daily, prepared and broadcast by students. KUSU is a member of the National Association of Educational Broadcasters.

(8) *Utah State University Lyceum and Cache Valley Civic Music*. The Lyceum - Civic Music series presents numerous national and international artists.

(9) *Dances and Entertainments*. In addition to the above, the Student Body Organizations furnish extensive entertainment in the form of dancing, parties, and athletic events.

(10) *Assemblies*. These are planned and produced by students to provide entertaining, spiritual and cultural programs.

(11) *Committees*. Students are members of virtually every university committee. This includes not only Student Body committees, but also committees set up by the administration.

(12) *University Forum* brings internationally famous speakers to the campus.

### 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 ASUSU are admitted by activity card.

*The Executive Council* consists of the five elected major officers of Associated Students; viz., presidents, secretary and business manager. 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 student body. Membership in the Student Senate includes: the Executive Council, the president of each of the four classes, a representative of each of the seven colleges, AWS president, the NSA coordinator, two representatives of independent students, and an international representative chosen by the foreign students on campus. There are three ex-officio members: president of Panhellenic, president of Interfraternity Council, and editor of Student Life.

*Associated Women Students*. Every woman student properly registered and enrolled in the University 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*. Boards and councils composed of students and faculty supervise various activities: Women's Intramural Association, Men's Intramural Association, Civic Music, Athletic Council, Publications Council, Student Union Board, Student Union Activity Board, Interfraternity Council and Panhellenic Council.

## **Student Organizations**

### **Departmental and Professional**

**Agriculture.** Ag Clubs Council, Ag Economics Club, Agronomy Club, Alpha Tau Alpha, Alpha Zeta, Block and Bridle Club, Botany Club, Dairy Club, Horticulture Club, Poultry Club, 4-H Club, Vet Science Club.

**Bacteriology.** Bacteriology Club.

**Business.** Alpha Kappa Psi, STAT Club (Secretaries Today and Tomorrow).

**Chemistry.** American Chemical Society.

**Education.** Phi Delta Kappa, Utah State Education Association.

**Engineering.** Engineering Council, American Society of Civil Engineers, American Welding Society, Industrial Education Club, Institute of Radio Engineers, Sigma Tau, Society of Automotive Engineers, Society of American Military Engineers, Tool Engineers Club.

**English.** English Club.

**Forestry.** Forester's Club. Forestry Wives, Xi Sigma Pi.

**Geology.** Geology Club.

**History.** Phi Alpha Theta.

**Home Economics.** Home Economics Club, Phi Upsilon Omicron.

**Landscape Architecture.** Landscape Architecture Club.

**Military.** Arnold Air Society, Pershing Rifles, Scabbard and Blade, Sponsors, Society of American Military Engineers.

**Music.** Alpha Eta Mu, Band, Chansonettes, Meistersingers, Orchestra, ROTC Band.

**Physical Education.** Badminton Club, Dance Club, PEMM (P. E. majors and minors), Ski

Club, Square Dance Club, Swimming Club, Women's Intramural Association, Men's Intramural Association.

**Political Science.** International Relations Club, Pi Sigma Alpha.

**Pre-Med.** Alpha Epsilon Delta.

**Psychology.** Psychology Club.

**Sociology.** Sociology Club.

**Speech.** Tau Kappa Alpha, Theta Alpha Phi, Utah State University Speech Correction Association.

**Zoology.** Utazoa Club.

### **Social and Special Interest**

**Fraternalities, Social.** Alpha Gamma Rho, Delta Sigma Phi, Kappa Sigma, Pi Kappa Alpha, Sigma Alpha Epsilon, Sigma Chi, Sigma Nu, Sigma Phi Epsilon, Sigma Pi.

**Sororities, Social.** Alpha Chi Omega, Alpha Omicron Pi, Chi Omega, Delta Delta Delta, Kappa Delta, Sigma Kappa.

**Recognition and Honorary.** Alpha Sigma Nu, Sigma Xi.

**Regional.** Bear Lake Club, Canadian Club, Dixie Club, Sudags, Weber, Arab Student Organization.

**Religious.** Baptist Student Union, Delta Phi, Lambda Delta Sigma, Newman Club, Westminster Fellowship, Interreligious Council.

**Scholarship.** Phi Kappa Phi, Alpha Lambda Delta, Phi Eta Sigma.

**Service.** Blue Key, Circle K Club, Intercollegiate Knights, Spurs, Sponsors.

**Miscellaneous.** Cosmopolitan Club, Dames Club, Human Relations Club, Independent Students Association.



*Alumni Association and  
University Development*



# USU Alumni Association

Joseph F. Cowley, President

Lyn (Swede) Larson, Executive Secretary

Office in Student Union Building 210

Utah State University Alumni Association now numbers more than 27,000 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 welfare of Utah State University.

*Membership.* (1) *Regular Member:* All persons receiving degrees, diplomas or terminal vocational certificates from Utah State University, College of Southern Utah, or Snow College are members of the Association upon payment of dues. All graduating students of USU receive a paid-up, two-year membership in the Alumni Association. (2) *Associate Member:* All students who have been regularly enrolled in one of the three 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.

*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 \$35, or \$50 for a joint membership, both payable in \$10 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 Student 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. Members receive the Utah State *Alumnus*, a magazine published nine months a year, 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,

Founders' Day, 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

Rudy Van Kampen, Chairman

Lyn (Swede) Larson, Fund Director

### Office in Student Union Building 210

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, as follows:

USU Board of Trustees: Henry R. Hurren, David W. Evans; Alumni Association: Joseph F. Cowley, Daken K. Broadhead, Charles G. Cowley, Rudy Van Kampen, J. K. Wheeler; the University Administration and Faculty; President Daryl Chase, Dee A. Broad-

bent, J. Elliot Cameron; the Associated Students: John Cannon; General Public: B. H. Stringham, Marden D. Pearson, E. W. Jenkins, LeGrand Johnson.

Fund officers are: Rudy Van Kampen, chairman; J. K. Wheeler, vice-chairman; Dee A. Broadbent, treasurer; Lyn (Swede) Larson, fund director.

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 students of the University and from other interested persons, corporations or founda-

tions 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 Develop-

ment 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.

*University Faculty  
and Collaborators*

# Utah State University

## Faculty for 1961-62

The following USU Faculty list contains: the faculty member's name, the year he first joined the USU staff (not necessarily in present position); his present academic rank and position; the degrees he holds, the years these were received and the schools from which received; a brief summary of his training, experience or/and accomplishments as related to his present position at USU.

See also lists of Emeritus Faculty, College of Southern Utah Faculty, Snow College Faculty, and Federal Collaborators stationed at USU.

**CHASE, DARYL** (1945) President; Professor. BA 1927 U of U, MA 1931, PhD 1936 U of Chicago. Dean of Students USU; Director of Public Relations USU; Director of CSU.

**ABRAMS, MILTON C.** (1949) Librarian; Asso. Prof. BS 1948, MS 1952 USU. Graduate work at Denver U and U of U.

**ACORD, CLAIR R.** (1947) Utah Co. Ext. Agent; Ext. Asso. Prof. BS 1937 USU, MS 1956 U of Ill. Millard Co. Asst. Agent; Uintah Co. Agent.

**ALLRED, A. FULLMER** (1945) Box Elder Co. Ext. Agent; Ext. Asst. Prof. BS 1938 BYU. Sanpete Co. Agent; Carbon Co. Agent.

**ALLRED, J. R.** (1958) University News Editor; Instr. in Journalism. BA 1950 U of U, graduate work at Colo. State U. Sports Publicity Director, Colo. State U.

**ALLRED, KEITH REID** (1957) Asst. Prof. of Agronomy. BS 1951 BYU, PhD 1955 Cornell U.

**\*ANDERSON, BRUCE** (1951) Asst. Prof. of Irrigation Engineering. BS 1950, MS 1954 USU, graduate work U of Calif. Consultant in Iran; Ext. Irrigation Specialist.

**ANDERSON, CHESTER H.** (1959) Colonel, US Army; Prof. of Military Science and Tactics. BS 1930, EdM 1935 Oklahoma U. High School Principal and Superintendent

of Schools, Oklahoma. Graduate US Army Command and General Staff College 1947.

**ANDERSON, JAY O.** (1951) Prof. of Poultry Husbandry. BS 1943 USU, MS 1948, PhD 1950 U of Maryland.

**ANDERSON, ROICE H.** (1947) Prof. of Agricultural Economics. BS 1939 U of Wyo., MS 1941, PhD 1943 Cornell U, Postdoctoral work, Stanford U.

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**CULMSEE, CARLTON F.** (1945) Dean, C of Humanities and Sciences; Prof. of American Studies. BS 1932 BYU, MA 1937, PhD 1940 State U of Iowa. Research, teaching for National Chengchi U, Formosa; Director of Ext. Division, Head of Journalism Dept. at BYU. Editor of *Utah Sings*, Vol. II.

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**HARMON, M. JUDD** (1951) Asso. Prof. of Political Science, History. BS 1948 USU, MS 1950, PhD 1953 U of Wis. Author of *The New Deal: A Revolution Consummated*.

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**HAREIS, LORIN E.** (1945) Prof. of Animal Husbandry. BS 1937 USU, MS 1938, PhD 1940 U of Ill.

**HARRISON, GLADYS L.** (1936) Editor, Agricultural Experiment Station; Asso. Prof. AB 1922 BYU, Certificate of Librarianship 1936 U of Calif., graduate work USU, BYU, Iowa State C.

**HASLEM, DEAN W.** (1950) Manager, USU Bookstore. BS 1949 BYU, MS 1957 USU.

**HASSELL, ROBERT L.** (1947) Carbon Co. Ext. Agent; Ext. Asso. Prof. BS 1942 BYU, MS 1957 Cornell U.

**HATCH, LAPRELE S.** (1944) Instr. in Library Science. Normal degree in Elementary Education, eligible for Life Teaching Certificate in 1914, graduate study USU. Cataloging Librarian BYU.

**HATCH, TERRANCE E.** (1954) Asso. Prof. of Education. BS 1943, MS 1949 USU, EdD 1954 U of Calif.

**HAWS, B. AUSTIN** (1957) Asso. Prof. of Entomology. BS 1948, MS 1949 USU, PhD 1955, Iowa State C.

**HELM, WILLIAM T.** (1959) Asst. Prof. of Wildlife Management. BS 1950, MS 1951, PhD 1958 U of Wis., postgraduate work U of Wis.

**HENDERSON, GEORGE R.** (1944) Ext. Animal Husbandry Specialist; Prof. BS 1929, MS 1930 USU. Colo. Ext. Service.

**HENDRICKS, KING** (1935) Prof. and Head, Dept. of English and Journalism. MA 1926, PhD 1941 Stanford U, graduate work U of Berlin. Co-author *Communication Skills* (Basic Communication text).

**HEYBORNE, ROBERT L.** (1957) Asst. Prof. of Electrical Engineering. BS 1949, MS 1960 USU. Graduate Naval Electronics School, Instr. Naval Electronics School.

**HIGBEE, ARTHUR L.** (1959) Ext. Radio-TV Specialist; Asst. Prof. BS 1948 USU. Program Director KVVU Radio; Manager KSUB Radio, Cedar City; Program Director KDYL, (now KCPX); TV ann. KVIV (now KCPX-TV).

**HILL, LEON M.** (1957) Instr. in Industrial, Technical Education. BS 1952 USU.

**HIMES, ELLVERT H.** (1954) Chairman of Graduate Programs in Education; Prof. of Education. AA 1929 Kansas City Jr. C., BS 1931 U of U, MA 1937 U of Kansas, PhD 1950 U of U. Dean of Students, USU. Co-author of *Salt Lake City—Your Community*.

**HOLDREDGE, RUSSELL M.** (1959) Asst. Prof. of Mechanical Engineering. BS (Bus.) 1956, BS (ME) 1956, MS 1959 U of Colo.

**HOLMAN, VALERA G.** (1951) Head Teacher, Child Development Laboratory, Cooperative Nursery School. BS USU, graduate work USU.

**HOLMGREN, ARTHUR H.** (1943) Asso. Prof. of Botany, Plant Pathology. BA 1936 U of U, MS 1942 USU, doctoral work at U of Calif. Author of *Handbook of the Vascular Plants of Northeastern Nevada*; *Handbook of the Vascular Plants of the Northern Wasatch*.

**HORSLEY, G. SMOOT** (1960) Asso. Prof. of Electrical Engineering. BA 1950, MA 1952, PhD 1954 U of U. Member Technical Staff, Bell Telephone Laboratories; project engineer, semiconductor device development, Motorola; Asst. Dir., Production Manager, Manager of Product Development Shockley Transistor Corp.

**HUBER, THELMA** (1939) Prof. and Supervisor of Home Economics Programs, Ext. Service. BS 1925, MS 1931 USU, doctoral work at Columbia U, Cornell U.

**HUGHES, J. KEITH** (1952) Washington Co. Ext. Agent; Ext. Asst. Prof. BS 1950 USU. Davis Co. Asst. Ext. Agent.

**HUMPHERYS, BOYD** (1960) Chief Engineer, Television and Radio. BS 1949 USU, Engineer KSL-TV; Project Engineer, Sperry Utah Engineering Lab.

**HUNSAKER, H. B.** (1935) Prof. and Head, Dept. of Health, P. E. and Recreation; Director of Athletics. BS 1930 USU, MS 1932 U of Ore., doctoral work U of Calif., U of Wash., U of U.

**HUNSAKER, LLOYD R.** (1936) District Ext. Director-Logan; Ext. Agriculture Supervisor; Prof. BS 1935 USU, MS 1948, PhD 1957 U of Minn. Asst. Dairy Specialist; Cache Co. Ext. Agent; Piute Co. Ext. Agent.

**HUNSAKER, NEVILLE C.** (1941) Prof. and Head, Dept. of Mathematics. BA 1930 U of U, MA 1932 U of Calif., PhD 1948 Rice Institute, postdoctoral studies U of Ill.

**HURST, CLYDE** (1940) Instr. in Industrial and Technical Education; General Motors training in hydraulics, controlled coupling, automatic transmissions.

**HURST, REX L.** (1952) Prof. and Head, Dept. of Applied Statistics. BS 1948, MS 1950 USU, PhD 1952 Cornell U, visiting professor at Iowa State U.



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- JACKSON, ARTHUR D.** (1958) Principal, Edith Bowen Laboratory School; Asst. Prof. of Education. BS 1943 Colo. C, MS 1949 USU, doctoral work at Stanford U, U of Texas.
- JACOBSEN, GENE S.** (1957) Director of Summer School; Asso. Director of University Ext. Services; Asso. Prof. of Education. BS 1949, MS 1954 USU, EdD 1957 U of Calif.
- JAMES, RAYMOND** (1959) Asst. Prof. of Business Administration. BS 1948 USU, MS 1952 New York U.
- JARRETT, VON H.** (1952) Asst. Prof. of Agricultural Engineering. BS 1948, MS 1954 USU.
- JENSEN, CLAYNE R.** (1956) Asst. Prof. of Physical Education, Recreation; Ext. Recreation Specialist. BS 1952, MS 1956 U of U.
- JENSEN, JAY O.** (1942) Asst. Prof. of Physics. BS 1940 USU, graduate work USU, U of Ore.
- JENSEN, LOUIS A.** (1946) Ext. Agronomy Specialist; Asst. Prof. of Agronomy. BS 1939, MS 1960 USU. Duchesne Co. Ext. Agent; Millard Co. Asst. Ext. Agent.
- JENSEN, NAOMI** (1944) Summit Co. Home Ext. Agent; Ext. Asst. Prof. BS 1938 USU, graduate work USU. Sanpete Co. Home Ext. Agent.
- JOHNSON, ELWIN E.** (1958) Captain USAF; Asst. Prof. of Air Science. BS 1951, Texas Tech. C.
- JOHNSON, THETA** (1943) Ext. Clothing Specialist; Asso. Prof. BS 1938 USU, MA 1953 Columbia U. Davis Co. Home Ext. Agent; Carbon Co. Home Ext. Agent.
- JONES, LEWIS W.** (1938) Prof. and Acting Head, Dept. of Bacteriology and Public Health. BS 1936, MS 1947 USU, PhD 1953 Stanford U, National Science Foundation Fellowship.
- JONES, WILLIAM L.** (1947) Asso. Prof. of Electrical Engineering. BS 1944 U of Ill., MS 1949 USU, EE 1956 Stanford U. Navy engineering, communication, radar schools Columbia U, Harvard U., Bowdin C.
- JORGENSEN, MARY ANN** (1960) Emery Co. Ext. Home Agent; Ext. Instr. BS 1960 USU.
- KEARNS, FRANK W.** (1960) Asst. Prof. of Forest Management. BS 1951 USU, MS 1958 Mich. State U.
- KEARSLEY, AMY R.** (1940) Asso. 4-H Club Leader; Asso. Prof. BS 1933 USU, MA 1947 Columbia U, graduate work at U of Maryland. Cache Co. Home Ext. Agent.
- KEETCH, RUSSELL R.** (1929) Ext. Sheep and Wool Specialist; Asso. Prof. BS 1929 USU MA 1951 Colo. State U. Supervisor of County Agents; Sanpete Co. Ext. Agent; Uintah Co. Ext. Agent; Wasatch Co. Ext. Agent.
- KELKER, GEORGE HILLS** (1937) Prof. of Wildlife Management. BA 1928 Hiram C, BSF 1931, MSF 1932, SCD 1946 U of Mich. Studies at U of British Columbia. Author of **Research Methods for the Beginner**.
- KELLER, JACK** (1960) Asst. Prof. of Civil Engineering. BS 1953 (CE) Colo. U, MS 1955 (IE) Colo. State U. Research USDA ARS; Sales manager and irrigation engineer W. R. Ames Co. Co-author **Irrigation Handbook**.
- KEMP, ANTONE B.** (1941) Instr. in Industrial, Technical Education. Welding Engineer, student employee of John Huntington Poly. Tech. Cleveland, Ohio.
- KEPNER, HAROLD R.** (1930) Prof. of Civil Engineering. AB 1917 Ohio Wesleyan U., BS 1920, SM 1925 Mass. Institute of Tech.
- KIEFER, FRED W., JR.** (1955) Asst. Prof. of Civil and Irrigation Engineering. BS 1950 USU, MS 1953 Colo. State U.
- KLAGES, KARL W.** (1957) Athletics News Editor; Instr. in Journalism. BA 1952 U of Idaho, graduate work Washington State C, professional work in radio.
- KNAP, ANTHONY J.** (1959) Asst. Football Coach. BS 1939, MS 1953 U of Idaho. Head coach Pittsburgh High; coach Potlach High, Idaho; coach Lewiston High and Bonners Ferry High; USNR.
- KNOWLTON, GEORGE F.** (1925) Prof. of Entomology, Ext. Specialist. BS 1923, MS 1925 USU, PhD 1932 Ohio State U, post-doctoral work U of Minn.
- KOTTER, CLEON M.** (1958) Agricultural Information Specialist; Ext. Service; Asst. Prof. BS 1954 BYU.
- KOWALLIS, THEODORE R.** (1960) Instr. in Dairy Industry. BS 1958 USU, graduate work USU.
- LAMB, ROBERT C.** (1960) Asst. Prof. of Dairy Husbandry. BS 1956 USU, MS 1958 Mich. State U, completing PhD at Mich. State U.

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**LARSON, G. OLOF** (1957) Asst. Prof. of Chemistry. BS 1948, MA 1951 U of U, PhD 1959 Washington State C.

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**LARSON, LYN** (1960) Director of Alumni Association and University Development. BS 1947 USU. Bureau Chief for Deseret News, Logan; editor Farm and Garden Section, Deseret News.

**LEE, GARTH L.** (1954) Asso. Prof. of Chemistry. BA 1944, MA 1947 U of U, PhD 1949 U of Toronto. Author of *Laboratory Manual for General Chemistry* and textbook, *General Chemistry*.

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**LEWIS, EVELYN HODGES** (1938) Asso. Prof. of Sociology. BS 1929 USU, MA 1938 U of Chicago, doctoral work U of Calif., U of Chicago.

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**LINDSAY, HAROLD** (1956) Garfield Co. Ext. Agent; Ext. Asst. Prof. BS 1947 USU, Salt Lake Co. Asst. Ext. Agent.

**LINDSTROM, GAELL** (1957) Asst. Prof. of Fine Arts. BS 1952 U of U, graduate work at Calif. C of Arts and Crafts.

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**\*LOVELESS, AUSTIN G.** (1952) Asso. Prof. of Engineering Graphics; Asst. to Dean, C of Engineering. BS 1947 USU, MS 1952 Ore. State C, graduate work U of Mo., Kennecott Copper Corp., Civil Service Commission; draftsman, Instr. in Provo City schools.

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**MATTHEWS, DOYLE J.** (1951) Asso. Prof. of Animal Husbandry. BS 1950, MS 1951 USU, PhD 1959 Kansas State U.

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**MAUGHAN, RALPH B.** (1951) Asst. Coach; Asst. Prof. of Physical Education. BS 1947; MS 1948 USU. Detroit Lions professional football.

**MAUGHAN, WESLEY T.** (1955) Rich Co. Ext. Agent; Ext. Asst. Prof. BS 1951 USU. Asst. Salt Lake Co. Ext. Agent.

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**McIFF, LYLE H.** (1960) Asst. Prof. of Accounting and Business Administration. BS 1948 BYU, MBA 1951 U of Texas. Doctoral work at U of So. Calif. Author of *Study Guide for Principles of Accounting*.

**McKINNON, JANE** (1961) Instr. in Physical Education, Recreation. BS 1959 USU, graduate work U of U. Taught part-time at USU; taught private dance lessons.

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**MELINE, ROBERT I.** (1960) Inst. in Military Science; Sgt. Instr. at Ft. Ord, Calif.

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**MERKLEY, MARGARET B.** (1951) Instr. in Home Economics Education, Food and Nutrition. BS 1951, MS 1952 USU, PhD 1960 Texas Women's U.

**MERRELL, MABEL** (1956) Iron Co. Ext. Home Agent; Ext. Asst. Prof. BS 1948 U of I. Duchesne Co. Home Agent.

**MERRILL, M. R.** (1926) Vice-President; Prof. and Head, Dept. of History and Political Science. BS 1925 USU, MA 1932, PhD 1951 Columbia U. Dean of Summer School; Dean, C of Business and Social Sciences.

**MERRILL, SAMUEL W.** (1956) Instr. in Industrial and Technical Education. BS 1942 USU, graduate work USU.

**MEYER-ARENDT, JURGEN R.** (1960) Asso. Prof. of Physics. MD 1945 U of Wuerzburg, PhD 1952 U of Hamburg, Germany. Asso. Prof. at U of Sao Paulo, Brazil and Ohio State U. Fellow, Ohio Academy of Science. Author of *Vision and Optics in Nondestructive Testing* handbook.

**MICHAELSON, LEON C.** (1950) Supervisor of Agricultural Programs; Ext. Farm Management Specialist; Asso. Prof. BS 1937 USU, MS 1938 Mont. State U. Cache Co. Ext. Agent.

**MILLER, AKELEY** (1960) Asst. Prof. of Physics. BA 1950, MA 1952 U of S. Dak., PhD 1960 U of Mo. Instr. in Physics, U of S. Dak. and U of Mo.

**MILLER, ELNA** (1928) Ext. Foods and Nutrition Specialist; Prof. BS 1921 USU, MS 1926 Columbia U.

**MILLER, GENE W.** (1957) Asst. Prof. of Botany and Plant Pathology. BS 1950, MS 1954 USU, PhD 1957 No. Carolina State C.

**MILLER, RAYMOND W.** (1956) Asst. Prof. of Agronomy. BS 1952, MS 1953 U of Ariz., PhD 1956 C of Wash.

**MILLIGAN, CLEVE H.** (1943) Prof. and Head, Dept. of Civil and Irrigation Engineering. BS 1932 USU, MS 1933 U of Calif. Ten years professional engineering US Forest Service and US Army Engineer.

**MINER, MERTHYR L.** (1943) Prof. and Head, Dept. of Veterinary Science. BS 1937 USU, DVM 1941 Iowa State C, Postdoctoral work U of Minn.

**MOORE, J. REED** (1945) Summit Co. Ext. Agent; Ext. Asst. Prof. BS 1936 USU, graduate work at Cornell U. Kane Co. Agent.

**MOORE, RAYMOND R.** (1946) Asso. Prof. of Forest Management. BS 1936 Penn. State U, MF 1946 Yale U, doctoral work at U of Calif., U of Wash.

**MOORE, WILLIAM M.** (1960) Asst. Prof. of Chemistry. BA 1952 Colo. C, PhD 1959 Iowa State U. Postdoctoral fellow, Cambridge, England. Research Chemist, Monsanto Chemical Co.

**MORGAN, FLOYD T.** (1943) Asso. Prof. of Fine Arts. BS 1934 USU, MA 1939 State U. of Iowa, doctoral work at State U of Iowa and Stanford U.

**MORRIS, LAVAL S.** (1939) Prof. and Head, Dept. of Landscape Architecture and Environmental Planning. BS 1923 USU, MS 1925 Mich. State U, MLA 1933 Harvard U.

**MORRISON, EARNEST M.** (1945) Prof., and Acting Head, Dept. of Agricultural Economics. BS 1937 USU, MS 1939 U of Calif., doctoral work at U of Ill., No. Carolina State.

**MORSBERGER, ROBERT** (1959) Asst. Prof. of English. BA 1950 John Hopkins U, MA 1954, PhD 1956 State U of Iowa. Study summer at Stratford-Upon-Avon, England.

**MORTENSEN, J. LYNN** (1950) Asst. Prof. of English. BS 1949, MS 1950 USU, graduate work U of U.

**MORTIMER, WILLIAM E.** (1943) Prof. and Head, Dept. of Industrial and Technical Education. BS 1928 BYU, MS 1942 Ore. State C, EDD 1956 U of Mo.

**MURRAY, EVAN B.** (1934) Prof. and Head, Dept. of Economics. BS 1927, MS 1930 USU, graduate work U of So. Calif., U of Chicago.

**MUSSLER, HANS K.** (1960) Instr. in Languages. Certificate of compl. music conservatory, Frankfurt-Main, Germany, BA 1958 BYU, MA 1960 Yale, working on PhD Yale. Instr. at BYU.

**MYERS, CHESTER J.** (1926) Prof. of Speech. BS 1921 U of U, MA 1925 U of Iowa, PhD 1940 U of So. Calif. Instr. at U of So. Calif, U of Iowa, Weber College; critic teacher in Speech, U of Iowa Training School.

**NEECE, GUS W.** (1958) Univ. Physician. MD 1933 U of Ill. Colonel, USAF, retired 1958.

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**NELSON, DALE O.** (1947) Asso. Prof. of Physical Education. BS 1942, MS 1948 USU, PhD 1957 U of So. Calif.

**NELSON, MARY** (1946) Asso. Prof. of Mathematics. BA 1933 USU, MS 1938 State U of Iowa.

**NESMITH, ROBERT E.** (1957) S/Sgt. USAF, Personnel NCO, AFROTC Det.

**NEUBERGER, L. MARK** (1932) Dean of Admissions and Records; Secretary to the Board of Trustees; Prof. of Business Administration. BS 1932, MS 1934 USU, doctoral work U of Chicago, U of So. Calif, U of Calif. Graduate of Associate and Personnel Management courses of The Adjutant General's School; executive assistant to the President. Author of *Cases in Office and Personnel Management*.

**NEUHOLD, JOHN M.** (1958) Asst. Prof. of Wildlife Management. BS 1952, MS 1954, PhD 1959 USU.

**NIELSEN, H. M.** (1941) Asst. Prof. of Chemistry. BS 1933, MS 1936 USU.

**NIELSEN, VENETA L.** (1946) Lecturer in English. BS 1940, MS 1950 USU, study at Columbia U and U of Calif.

**NIELSON, REX F.** (1949) Asst. Prof. of Agronomy. BS 1947, MS 1949 USU.

**NOBLE, LEE GRANDE** (1945) Prof. of Education. BS 1924 BYU, MS 1939, EdD 1944 U of So. Calif. Director of Summer School, USU.

**NYMAN, EDITH** (1955) Asst. Prof. and Head, Dept. of Household Administration. BS 1943, MS 1958 USU, graduate work Mich. State U.

**NYMAN, ROSS A.** (1946) Instr. in Engineering and Graphics. BS 1954 USU, graduate work USU and Ore. State C.

**OGDEN, MARVEN J.** (1956) Millard Co. Ext. Agent; Ext. Asst. Prof. BS 1940 USU, graduate work USU.

**OGDEN, PHIL REED** (1956) Asst. Prof. of Range Management. BS 1952, MS 1956 USU, doctoral work 1960 Iowa State C.

**OLSEN, DONALD** (1955) Asst. Prof. of Geology. BS 1948 USU, MS 1951, PhD 1960 U of U.

**OLSEN, FLORIS S.** (1950) Asst. Prof. of Business Administration and Secretarial Science. BS 1944 U of U, MS 1952 USU.

**OLSON, CHARLES P.** (1952) Lecturer in Political Science. BS 1939 USU, JD 1946 Geo. Wash. U.

**OLSON, GERALD RAY** (1956) Emery Co. Ext. Agent; Ext. Asst. Prof. BS 1956 USU. Cache Co. Asst. Ext. Agent.

**OLSON, L. ELMER** (1955) Asst. Prof. of Chemistry. BS 1941 USU, MS 1947 U of U, PhD 1957 U of Ill.

**PAHTZ, GEORGE** (1946) Instr. in Music in Dept. of Fine Arts.

**PALFREYMAN, BERNICE** (1944) Salt Lake Co. Ext. Home Agent; Ext. Asst. Prof. BS 1940 USU, graduate work 1959 George Wash. U. Duchesne Co. Home Ext. Agent; Sanpete Co. Home Ext. Agent.

**PARRISH, JOSEPH** (1934) Salt Lake Co. Ext. Agent; Ext. Asso. Prof. BS 1933 USU. Juab Co. Ext. Agent; Grand Co. Ext. Agent.

**PATRICK, JOHN M.** (1957) Asso. Prof. of English. AB 1942, MA 1947 Southwestern U, PhD 1956 Georgetown U, postdoctoral work U of Texas, U of Minn. and Chinese Language School. Author of *Buried Astronomy*.

**PEARCE, JANICE** (1957) Instr. in Health, Physical Education and Recreation. BS 1952 U of U, MS 1957 State C. of Wash.

**PEDERSEN, IVAN** (1953) Asst. Prof. of Elementary Education. BS 1950, MS 1955 USU.

**PENNOCK, JOHN ALBERT** (1959) Asst. Prof. of Sociology. BA 1949, MS 1951 U of U, graduate certificate of social work 1950 U of U, post graduate work San Diego State C.

**PETERSEN, ANNETTE B.** (1957) Instr. in Business Administration and Secretarial Science. BS 1956 USU.

**PETERSON, DEAN F., JR.** (1957) Dean, C of Engineering; Prof. of Civil Engineering. BS 1934 USU, MCE 1935, DCE 1939 Rensselaer Polytechnic Institute. Commander, US Naval Reserve. Prof. and Head, Civil Engineering Dept., Colorado State U.

**PETERSON, EDWIN L.** (1937) Asso. Prof. of Social Science. BS 1937, MS 1941, PhD 1957 USU, graduate work U of Calif. Former Admin. Asst. to Congressman H. A. Dixon.

**PETERSON, HOWARD B.** (1940) Prof. and Head, Dept. of Agronomy. AB, MA 1935 BYU, PhD 1940 U of Neb. Co-author of text, *Irrigated Soils*.

**PIERSON, NORMA W.** (1960) Instr. in Home Economics, Clothing and Textiles. BS 1942, MS 1961 USU.

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**POLLARD, LEONARD H.** (1939) Prof. and Head, Dept. of Horticulture. BS 1932, MS 1934 USU, PhD 1939 U of Calif.

**POPE, WENDELL L.** (1959) Asst. Prof. of Mathematics. BS 1956 USU, MS 1958 Stanford U.

**\*PORTER, GORDON E.** (1947) Asst. Prof. of Languages. BS 1943 USU, graduate work Stanford U and U of Wash. In US Foreign Service, Rio de Janeiro, Brazil. Presently doing graduate work at U of Ariz.

**POST, THOMAS R.** (1957) SFC, Asst. Instr. in Military Science.

**POULSON, JENNIEV J.** (1947) District Supervisor of Home Economics Programs; Ext. Asso. Prof. BS 1933 BYU, MS 1954 Iowa State U, graduate work Cornell U. Utah Co. Ext. Home Agent.

**PREATOR, FREDERICK** (1937) Prof. and Head, Dept. of Tool and Manufacturing Engineering. BS 1935 USU, MS 1947 Wayne State U. Birmingham (England) Technical School 1916, Royal Air Force (Britain) Professional Engineer, National Physics Lab., London; Production, Tooling and Manufacturing Engineering, Radio Product Corp, Adams Campbell Co, Lockheed Corp. and Manasco Engineering Corp.

**PUGH, LLOYD R., JR.** (1960) Major USAF; Prof. of Air Science. MS 1944 Military Academy.

**PUGMIRE, DOROTHY JEAN** (1956) Asst. Prof. of Elementary Education. BS 1948 USU, MA 1951 U of Mich. Work at Merrill-Palmer School.

**PURDY, MARY K.** (1961) Washington Co. Ext. Home Agent. BS 1940 BYU, graduate work Oregon State Co., Syracuse U and BYU. Consultant in Homemaking Education BYU; Nutrition Consultant School Lunch Program; Home Economics teacher.

**RALSTON, JOHN R.** (1959) Head Football Coach. AB 1951 U of Calif. Asst. football coach U of Calif; head coach, San Lorenzo High; Assistant football coach Diablo High; Marine Corps.

**RANSOM, VILATE** (1957) Instr. in Library Science. BS 1947 BYU, MSLS 1957 U of Denver.

**RASMUSSEN, HOWARD DALE** (1957) Instr. in Physical Education. BS 1949, MS 1956 USU.

**REAM, ELEANOR KONDO** (1959) Instr. of Food and Nutrition and Household Admin.

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**REESE, L. GRANT** (1955) Asst. Prof. of Language. BS 1955, MS 1956 USU, graduate work at U of Wash.

**RESCH, HELMUTH** (1960) Asst. Prof. of Forest Management. Dipl. Ingenieur (Hochschule f. Bodenkultur, Vienna Austria), MS 1960 USU. Assistant Hochschule f. Bodenkultur, Vienna, Austria.

**REYNOLDS, H. REUBEN** (1923) Prof. of Fine Arts. Graduate of Chicago Art Institute. Eight months travel and study in Europe, graduate study at State U of Iowa. Adviser to USU yearbook, *Buzzer*.

**RICE, MOYLE Q.** (1937) Prof. of English. BS 1936 USU, MA 1937 U of Neb., doctoral work at U of Chicago, Harvard U. Co-author of *Communication Skills* (Basic Communications text) and pageant, *Look on the Land*.

**RICH, ELLIOT** (1956) Asso. Prof. of Civil Engineering. BS 1943 USU, ME 1951 U of U, graduate work U of U.

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**ROGERS, DEXTER** (1960) Asst. Prof. of Food and Nutrition. BS 1944, MS 1946 U of Mich., PhD 1954 Ore. State C. Research chemist, section leader Western Condensing Co.; Swift and Co. predoctoral fellow, Ore. State C; National Science Foundation, postdoctoral fellow, Stanford U.; Instr., U of Mich. Research Asso. and Instr. U of Oregon.

**ROGERS, LEHI S.** (1950) Davis Co. Ext. Agent; Ext. Asst. Prof. BS 1950, graduate work 1957 USU. Wayne Co. Ext. Agent; Emery Co. Ext. Agent; Millard Co. Ext. Agent.

**ROSE, D. WAYNE** (1952) Kane Co. Ext. Agent; Ext. Asst. Prof. BS 1952 USU, MS 1959 U of Minn. Salt Lake Co. Asst. Ext. Agent.

**ROSKELEY, R. WELLING** (1947) Prof. and Head, Dept. of Sociology. BS, MS 1933 USU, PhD 1938 U of Wis. Author of *Sociology Under Analysis*.

**ROWLAND, PRISCILLA** (1945) Asst. Prof. of Food and Nutrition. BS 1923 USU, MS 1938 Ore. State C, doctoral work U of U, Ore. State C and Texas State C. for Women.

**SALISBURY, KATHRYN** (1960) Instr., Edith Bowen Laboratory School. BS 1948 USU. IBM operator.

**SALUNKHE, D. K.** (1954) Asso. Prof. of Horticulture. BS 1949 Poona U, India, MS 1950, PhD 1953 Mich. State U.

**SANDERS, RAYMOND T.** (1958) Asst. Prof. of Physiology. BS 1949, MS 1950 U of U, PhD 1956 Stanford U, postdoctoral work at Uppsala U, Sweden.

**SATO, HENRY M.** (1960) SFC, S/Sgt. Military Science. Studied at USU. Asst. unit instr. at Army Reserve Unit, Logan.

**SCHOULTE, INEZ L.** (1960) Asso. Prof. and Head, Dept. of Food and Nutrition. BS 1942 So. Dak. State C, MS 1952 UCLA. Asst. Prof. U of N. Dak. and East Carolina C.

**SHARP, HEBER C.** (1946) Prof. of Psychol-

ogy. BS 1944, MS 1945, PhD 1955 U of U. Associate of American Psychological Asso.

**SHAW, EDITH SMITH** (1942) Asso. Prof. of Education. BS 1936 USU, MA 1954 Northwestern U.

**SHAW, RICHARD J.** (1950) Asst. Prof. of Botany. BS 1948, MS 1950 USU, PhD 1961 Claremont Graduate School. Author of *Wildflowers of Yellowstone and Grand Teton National Parks*, co-author of *Laboratory Manual for Elementary Botany*.

**SHIPPS, ANTHONY W.** (1960) Asst. Librarian; Asst. Prof. of Library Science. AB 1949 Mercer U, MA 1951, PhD 1959 Northwestern U, AMLS 1960 U of Mich.

**SIGLER, WILLIAM F.** (1947) Prof. and Head, Dept. of Wildlife Management. BS 1940, MS 1941, PhD 1947 Iowa State C. Author of *Wildlife Law Enforcement*.

**SJOBLOM, WALLACE D.** (1952) Iron Co. Ext. Agent; Ext. Asst. Prof. BS 1952 USU. Cache Co. Asst. Ext. Agent.

**SKIDMORE, C. JAY** (1950) Asso. Prof. of Family Living and Child Development. BS 1943, MS 1944 U of U, EdD 1949 Columbia U, postdoctoral work and fellowship at Merrill Palmer School. Co-author of *Marriage Counseling*.

**SLAUGH, OWEN** (1956) Asso. Prof. of Industrial and Technical Education. BS 1952, MS 1957 USU.

**SMART, ROSS A.** (1957) Asst. Prof. of Veterinary Science. BS 1950 U of Idaho. DVM 1957 Colo. State U.

**\*SMITH, ALBERT B.** (1952) Asst. Prof. of Mechanical Engineering. BS 1951 USU. Agricultural Engineer, New Mexico State U.

**SMITH, ANNA MARIE** (1948) Instr. in Library Science. BA 1928 Park C, BSLS 1948 U of Denver.

**SMITH, ARTHUR D.** (1937) Prof. of Range Management. BS 1936 USU, MS 1937 U of Calif., PhD 1957 U of Mich. Co-author of *Range Management*.

**SMITH, HUBERT W.** (1947) Prof. of English. AB 1928 Park C, MS 1933 Northwestern U, PhD 1949 U of Penn. Co-author of *Communication Skills* (Basic Communications text).

**SMITH, R. L.** (1955) Asso. Prof. of Agronomy. BS 1951, MS 1952 USU, PhD 1955 UCLA.

\*On leave.



## 320 Faculty

**SMITH, RICHARD W.** (1960) Asso. Prof. of Military Science; Capt. BS 1953 West Kentucky State.

**\*SMITH, WINSLOW WHITNEY** (1946) Prof. and Head, Dept. of Bacteriology and Public Health. BA 1933, MA 1936 U of U, PhD 1939 U of Wis. Author of movie script, Grams' Stain.

**SMITH, WILLIAM LLOYD** (1954) Duchesne Co. Ext. Agent; Ext. Asst. Prof. BS 1953 Ricks C, MS 1956 USU.

**SOMERS, W. KARL** (1946) Asst. Prof. of Tool and Manufacturing Engineering. BS 1948, MS 1960 USU. Technical courses at Calif. Institute of Tech. and U of Calif.

**SORENSEN, EVAN J.** (1955) Asst. Basketball Coach; Instr. in Physical Education. BS 1947, MS 1954 USU.

**SPENCE, JACK T.** (1958) Asst. Prof. of Chemistry. BS 1951, PhD 1957 U of U, post-doctoral research U of Ore.

**\*STEFFEN, HYRUM** (1937) Asso. Prof. of Animal Husbandry. BS 1937 USU, MS 1950 U of Ill.

**STENQUIST, LEE B.** (1954) Internal Auditor. BS 1947 BYU, graduate study 1949 U of Wash. Advisor in Business Management, Karadj, Iran.

**STENQUIST, NORRIS J.** (1958) Roosevelt Co. Ext. Agent; Ext. Asst. Prof. BS 1957, MS 1958 USU.

**STEVENS, KENNETH R.** (1931) Prof. of Bacteriology and Public Health. BS 1927 BYU, MS 1929, PhD 1932 Rutgers U, post-doctoral work U of Ill. Author of *Elementary Bacteriology Laboratory Manual*.

**STEVENS, VELYN B.** (1945) Juab Co. Home Ext. Agent; Ext. Asst. Prof. BS 1926 BYU. Ext. Home Agent in Utah Co. and Tooele Co.

**STEVENSON, EVAN N.** (1955) Manager, Student Union; Coordinator, Student Activities. BS 1951 BYU.

**STEWART, J. J.** (1947) Editor of Publications; Asso. Prof. of Journalism. BS 1949 USU, MS 1957 U of Ore. UPI Correspondent; Deseret News Farm Editor, Feature Writer; Herald Journal City Editor; USU Ext. Service Editor; Head, USU News Bureau. Author of four books; co-author, Journalism textbook.

**STOCK, REED C.** (1959) Asst. Prof. of English. BS 1954 USU, MA 1958 Rutgers U, PhD in progress Rutgers U. Postgraduate work at Princeton U.

\*On leave.

**STODDARD, GEORGE E.** (1952) Prof. and Head, Dept. of Dairy Industry. BS 1943 U of Idaho, MS 1948, PhD 1950 U of Wis. Asst. Prof. Iowa State C.

**STODDART, L. A.** (1935) Prof. and Head, Dept. of Range Management, BS 1931, MS 1932 Colo. State U, PhD 1934 U of Neb. Author of *Range Management and Technical Writing*. Faculty research lecturer.

**STOFFEL, RONALD A.** (1960) Asst. Prof. of Fine Arts. BS 1956 San Francisco State C, MM 1960 U of Illinois. Advanced study in Vienna, Salzburg and London.

**STOKER, GOLDEN L.** (1945) Asso. Prof. of Agronomy. BS 1932, MS 1933 USU.

**STOKES, ALLEN W.** (1952) Asso. Prof. of Wildlife Management. BS 1936 Haverford C, MA 1941 Harvard U, PhD 1952 U of Wis.

**STOKES, L. DARRELL** (1941) Davis Co. Ext. Agent; Ext. Asso. Prof. BS 1938 USU. Wasatch Co. and Emery Co. Ext. Agent; Salt Lake Co. Asst. Ext. Agent.

**STOKES, MARSDEN B.** (1959) Asso. Prof. of Education. BA 1942 C of Idaho, MS 1951 U of Idaho, PhD 1959 U of Minn.

**STONE, DAVID R.** (1946) Prof. of Psychology. BA, MA 1943 U of U, PhD 1946 U of Chicago.

**STORM, LEO F.** (1960) Asst. Prof. of English. BA 1949 U of Wash., MA 1950 Edinburgh U, PhD 1958 U of Wash. Fellow U of Wash; Instr., Asst. Prof., Seattle U; Asst. Prof. LSU and Colo. State C.

**STREET, JOSEPH C.** (1956) Asst. Prof. of Animal Husbandry. BS 1950, MS 1952 Mont. State C, PhD 1954 Oklahoma State U. Instr. Oklahoma State U; Research Asso. at Northwestern U.

**STRINGHAM, GLEN E.** (1957) Ext. Irrigation Specialist; Asst. Prof. BS 1955 USU.

**STRONG, DOUGLAS C.** (1953) Asst. Prof. of Agricultural Economics. BS 1943, MS 1953 USU, graduate study at Mich. State U.

**SUMMERS, LOWELL P.** (1946) Asso. Prof. of Industrial and Technical Education. BS 1940, MS 1956 USU. Civil Aeronautics Adm. licensed instr. and authorized inspector.

**SWENSON, DAN H.** (1948) Asst. Prof. of Industrial and Technical Education. BS 1940, MS 1949 USU.

**SWINDLE, KARMA P.** (1950) Davis Co. Ext. Home Agent; Ext. Asso. Prof. BA 1929 BYU. Dean of Women, C of So. Utah.

**TANNER, HELEN J.** (1960) Instr., Edith Bowen Laboratory School. BS 1949 U of U. Teacher Richfield Elementary, Trinidad, Colo. Jr. High, Granite district.

**TAYLOR, J. GOLDEN** (1955) Asso. Prof. of English. BS 1936, MA 1940 BYU, PhD 1958 U of U, postdoctoral research at Harvard's Widener Library.

**TAYLOR, MORRIS H.** (1945) Ext. Livestock Marketing Specialist; Ext. Asso. Prof. BS 1937 USU, MS 1940, PhD 1958 U of Wis. Farm Labor Program.

**TAYLOR, STERLING A.** (1949) Prof. of Agronomy. BS 1941 USU, PhD 1949 Cornell U.

**TAYLOR, THOMAS A.** (1951) Asst. Prof. of Elementary Education. BS 1939, teaching certificate, 1941, MS 1954 USU. Taught high school science and coached at Payette, Idaho; taught high school science and coached at Woodland, Wash.

**TERASAWA, HARUKO** (1955) Asst. Prof. of Clothing and Textiles. BA 1953 U of U, MS 1956 Penn. State U.

**TEZAK, WILLIAM V.** (1955) Asst. Prof. of Business Administration and Secretarial Science. AB 1947 Western State C. of Colo., MBA 1948 U of Denver, doctoral work Indiana U.

**THATCHER, RAY A.** (1944) Morgan Co. Ext. Agent; Ext. Asst. Prof. BS 1942 USU, MS 1958 U of Calif. Garfield Co. Ext. Agent; Millard Co. Asst. Ext. Agent.

**THOMAS, DON W.** (1954) Asso. Prof. of Veterinary Science; Ext. Specialist. BS 1949 USU, DVM 1953 Iowa State C.

**THOMAS, JAMES ALAN** (1952) Asst. Prof. of Veterinary Science. DVM 1946 Colo. State U.

**THORNE, D. WYNNE** (1939) Director of University Research and of Agricultural Experiment Station; Prof. of Agronomy. BS 1933 USU, MS 1934, PhD 1936 Iowa State U. Research Asst. Prof. Iowa State C, Research Asso. U of Wis.; Asso. Prof. of Agronomy Texas A & M, Head of USU Agronomy Dept. Co-author of *Irrigated Soils*.

**THORNLEY, GWENDELLA** (1947) Asst. Prof. of Speech. BS 1940, MS 1947 USU, graduate work U of U and U of Calif. Compiled and edited annual Poetry Speaking Festival booklet since 1947; chairman of annual Poetry Contest.

**THORPE, EVERETT C.** (1936) Asso. Prof.

of Fine Arts. BS 1940 USU, MFA 1951 U of U, advanced study 1956 Syracuse U and Hans Hofmann, Mass.

**TINGEY, DELMAR CLIVE** (1924) Prof. of Agronomy. BS 1922, MS 1924 USU, doctoral work U of Minn.

**TINGEY, WILLIS A.** (1946) Asst. Prof. of Civil and Irrigation Engineering. BS 1928 USU, graduate work USU and U of Ill.

**TIPPETTS, RUTH PARRISH** (1944) Asso. Prof. of Consumer Education; Ext. Specialist. BS 1931 USU, graduate work USU, Iowa State U, U of U and Cornell U. Sanpete Co. Ext. Home Agent; Asst. Supervisor of Home Ec. programs.

**TIPPETTS, TWAIN C.** (1956) Prof. and Head, Dept. of Fine Arts. BS 1939, MA 1941 BYU, PhD 1960 UCLA.

**TOCHER, ARLEN CRAIG** (1959) Instr. in Landscape Architecture and Environmental Planning. BS 1957 USU.

**TOCHER, STEWART ROSS** (1952) Asso. Prof. of Forest Management. BS 1949, MS 1950 U of Calif.

**TOVEY, TERREL R.** (1960) Ext. Irrigation Specialist, BS 1951, MS 1952 USU. Asst. Research Engineer, Engineering Exp. Station; Ag. Eng. Bur. of Indian Affairs.

**TUELLER, LAMONT E.** (1931) Cache Co. Ext. Agent; Ext. Asso. Prof. BS 1931 USU. Iron Co. Agent; USU Experiment Station researcher.

**TURNER, LAVELL W.** (1959) Millard Co. Ext. Home Agent; Ext. Asst. Prof. BS 1954 BYU, MS 1959 U of Wis.

**TURNER, R. EYRE** (1959) Sixth grade teacher, Edith Bowen Laboratory School; Instr. in Education. BS 1954 USU, postgraduate work USU.

**TUTTLE, SARAH S.** (1947) Sanpete Co. Ext. Home Agent; Ext. Asso. Prof. BS 1925 USU. Salt Lake Co. Home Ext. Agent; Millard Co. Home Ext. Agent.

**TYLER, EMILY W.** (1958) Utah Co. Ext. Home Agent; Ext. Asst. Prof. BS 1931 BYU.

**VALLENTINE, JOHN F.** (1958) Ext. Range Management and Forestry Specialist; Asst. Prof. BS 1950 Kansas State, MS 1950 USU, PhD 1958 Texas A & M.

**VAN EPPS, GORDON A.** (1952) Asst. Prof. of Agronomy. BS 1942, MS 1948 USU.

**VAN ORDEN, HARRIS O.** (1946) Prof. of Chemistry. BS 1938 USU, MS 1942 State C of Wash., PhD 1951 Mass. Institute of Tech., postdoctoral work U of U.

## 322 Faculty

- VENDELL, EDWARD W., JR.** (1960) Asst. Prof. of Mechanical Engineering. BSME 1955, MS 1960 U of U. Experience as a refrigeration engineer and rocket propulsion engineer.
- WADSWORTH, HAROLD M.** (1946) Superintendent of Plant Operations and Maintenance. BS 1927 USU, graduate work USU and U of Wyo.
- WALKER, DAVID R.** (1960) Asso. Prof. of Horticulture. BS 1951, MS 1952 USU, PhD 1954 Cornell U, postdoctoral work at Oak Ridge Institute of Nuclear Studies; Associate Prof. of Horticulture, North Carolina State C.
- WALKER, J. LEROY** (1958) Lt. Colonel US Army; Asst. Prof. of Military Science. BA 1958 U of Maryland, graduate Army Command General Staff College 1953.
- WALLER, BEATA** (1960) Instr. in Languages. MS 1952 U of Lodz, Poland, MS 1960 Indiana U. Ten years instruction at Academy of Foreign Trade, Warsaw, Poland.
- WALLIS, CARL R.** (1957) Asst. Prof. of Engineering Graphics and Industrial Arts. BS 1949, MS 1957 USU.
- WAMSLEY, HELEN J.** (1946) Rich Co. Ext. Home Agent; Ext. Asst. Prof. BS 1937 USU.
- WARDLE, ALVIN** (1959) Asst. Prof. of Instrumental Music. BA 1951 BYU, MEd 1955 USU.
- WASSERMAN, IRVING** (1955) Asso. Prof. of Fine Arts. ML at U of Cracow, Poland, studied with Anton Webern and Ed. Steurmann in Vienna, Austria.
- WATKINS, BRUCE O.** (1953) Prof. of Electrical Engineering. BSEE 1934, EE 1947 U of Ariz., MSEE 1947 U of Mo., PhD 1954 U of Minn. Registered Engineer, Utah, Twelve years industrial and governmental experience. Author of *Electrical Engineering Fundamentals*.
- WATKINS, REYNOLD K.** (1947) Prof. and Head, Dept. of Mechanical Engineering. BS 1944 U of U, MS 1947 Mass. Institute of Tech., PhD 1957 Iowa State U. Registered Engineer, Utah.
- WELKIE, GEORGE W.** (1957) Asst. Prof. of Botany and Plant Pathology. BS 1952, MS 1954 Penn. State U, PhD 1957 U of Wis.
- WELTI, WALTER** (1925) Prof. of Fine Arts. BA 1924, MA 1934, MusD 1953 Ithaca College, studied in music at New York U, private voice with Eric Dudley, Isadore Luckstone, Paul Althouse, Edgar Schofield, all of New York.
- WENNERGREN, E. BOYD** (1959) Asst. Prof. of Agricultural Economics. BS 1951, MS 1956 USU, PhD 1959 Penn. State U.
- WIEBE, HERMAN H.** (1954) Asso. Prof. of Botany. BA 1947 Goshen C, MS 1949 U of Iowa, PhD 1953 Duke U, postdoctoral work at Oak Ridge Institute of Nuclear Studies.
- WIGGINS, EVELYN L.** (1956) Asst. Prof. of Elementary Education. BS 1947, MS 1958 USU, Utah Elementary Supervisor's certificate 1959.
- WILCOX, ETHELWYN B.** (1943) Prof. of Food and Nutrition. BS 1931, MS 1937, PhD 1942 Iowa State C.
- WILLEY, LYNN R.** (1946) Asst. Prof. of Industrial and Technical Education. Trade certificate 1939, BS 1950, MS 1953 USU, doctoral work U of Mo.
- WILLIAMS, FRANK R.** (1960) Head Wrestling and Baseball Coach, Freshman Football Coach; Instr. in Physical Education. BS 1948, MS 1956 USU. Coach, Student Personnel Director, Asst. Principal, Helena, Billings and Great Falls, Mont. High Schools. Author, *Football Scout and Score Book*.
- WILLIAMS, J. STEWART** (1935) Dean, School of Graduate Studies; Prof. and Head, Dept. of Geology. BS 1923 BYU, MS 1927 Columbia U, PhD 1932 Geo. Wash. U, postdoctoral work Yale U.
- WILSON, LEMOYNE** (1937) Asso. Prof. of Agronomy. BS 1927, MS 1932 USU.
- WISE, CECIL E.** (1958) Capt., Army Corps of Engineers; Asst. Prof. of Military Science and Tactics. BS 1950 Texas Tech. C.
- WOOD, JOHN K.** (1946) Prof. and Head, Dept. of Physics. BS 1941, MS 1942, PhD 1946 Penn. State U.
- WOODWARD, GUY O.** (1959) Asso. Prof. of Irrigation. BS 1938 USU, MS 1952 U of Wyo.
- WOODWORTH, CALVIN K.** (1958) Asst. Football Coach, Dept. of Intercollegiate Athletics. BS 1956 Oklahoma U.
- WRIGHT, E. WAYNE** (1957) Coordinator of Counseling Services; Asst. Prof. of Psychology and Guidance. BA 1952, MA 1953 BYU, EdD 1957 U of Calif.
- YARDLEY, SOFIA ANN** (1960) Beaver Co. Ext. Home Agent. Ext. Asst. Prof. BS 1957 BYU.

\*On leave.

# Emeritus Faculty

**Agren, Ellen, BS, MA**  
Professor Emeritus, Extension Services

**Allen, Bert**  
Instructor Emeritus in Photography

**Barrows, Effie S., BS**  
Professor Emeritus, Extension Services

**Boswell, Stephen R., BS**  
Professor Emeritus, Extension Services

**Bowen, Edith, BS, MS**  
Professor Emeritus of Education

**Brown, Almeda P., BS, MA**  
Professor Emeritus of Home Economics

**Caine, George B., BS, MA**  
Professor Emeritus of Dairy Industry

**Christensen, A. L., BS, MS**  
Professor Emeritus, Extension Services

**Dalley, Parley, BS, MS, ScD**  
Professor Emeritus, Physical Sciences

**Dancy, Charlotte E., RN**  
Professor Emeritus of Physiology

**Dyer, Dorothy T., BS, MA**  
Dean Emeritus

**Evans, R. J., BS, PhD**  
Professor Emeritus of Agronomy

**Fletcher, Calvin, BPD**  
Professor Emeritus of Art

**Gardner, Willard, BS, MS, PhD**  
Professor Emeritus of Physics

**Geddes, Joseph A., AB, AM, PhD**  
Professor Emeritus of Sociology

**Guymon, E. Lee, BS, MS**  
Professor Emeritus, Extension Services

**Hansen, Reuben, BS**  
Professor Emeritus, Extension Services

**Hayward, Ira, BS, PhM**  
Professor Emeritus of English

**Humpherys, L. R., BS**  
Professor Emeritus of Agricultural Education

**Israelson, Orson W., BS, MS, PhD**  
Professor Emeritus of Irrigation and Drainage Engineering

**Jennings, D. S., BS, PhD**  
Professor Emeritus of Agronomy

**Jensen, George C., AB, MA**  
Professor Emeritus of Modern Languages

**Lund, Nettie B., BS**  
Professor Emeritus, Extension Services

**Maeser, Sherwin, AB, PhD**  
Professor Emeritus of Chemistry

**Manning, William H., AB**  
Professor Emeritus of Music

**Martineau, V. L., BS**  
Professor Emeritus, Extension Services

**McBride, C. D., BS, MS**  
Professor Emeritus of Business Administration

**McClellan, Charles E., AB, MA**  
Professor Emeritus of Education

**Meyer, George A., BA, STB, PhD**  
Professor Emeritus of Languages

**Morris, A. J., BS, MS**  
Professor Emeritus of Dairy Industry

**Nelson, George**  
Instructor Emeritus in Physical Education

**Nichols, Delore, BS**  
Professor Emeritus, Extension Services

**Pedersen, N. Alvin, AB, MA, PhD**  
Dean Emeritus, College of Humanities and Sciences

**Pittman, Don W., BS, MS**  
Professor Emeritus of Agronomy

**Rich, Lyman, BS, MS**  
Professor Emeritus of Dairy Industry

**Richards, B. L., BS, MS, PhD**  
Professor Emeritus, Botany and Plant Pathology

**Ricks, Joel Edward, BA, MA, PhD**  
Professor Emeritus of History

**Sharp, David, Jr., BS**  
Professor Emeritus, Extension Services

**Smith, Albert E., BS**  
Professor Emeritus, Extension Services

**Sorenson, C. J., BS, MS**  
Professor Emeritus of Entomology

**Stanford, J. Sedley, BS, PhD**  
Professor Emeritus of Zoology and Entomology

**Stewart, Robert H., BS**  
Professor Emeritus, Extension Services

## 324 Faculty

**Swenson, Dan A., BS**  
Professor Emeritus of Woodwork and  
Building Construction

**Thain, Aldyth, MA**  
Professor Emeritus of Languages

**Thomas, W. P., BS, MS, PhD**  
Professor Emeritus, Agricultural Economics

**Tingey, V. H., BS, MS**  
Professor Emeritus of Mathematics

**Vermillion, Una, BA, MA**  
Professor Emeritus of Food and Nutrition

**Wrigley, R. L., BS**  
Professor Emeritus, Extension Services

**Davis, J. Victor, BS**  
Assistant Professor, Auto Mechanics

**Doney, Ronald, BS, MS**  
Instructor, Biology

**Eggert, Mary M., BS, MS, EdD**  
Associate Professor, Education

**Faux, Franklin J., BS, MS**  
Instructor, Chemistry and Mathematics

**Fillerup, Joseph M., BS, MA, EdD**  
Associate Professor, Education  
Chairman, Division of Education

**Gillies, Richard E., BS, MS**  
Dean of Students  
Assistant Professor, Social Science

**Halversen, Roy L., BS**  
Professor, Music and Education  
Chairman, Music Department

**Hansen, Gerald, BS, MS**  
Assistant Professor, Political Science

**Hardy, Eugene, BS**  
Associate Professor, Industrial Education  
Chairman, Division of Industrial Education

**Hatch, Conrad V., BS, MS, PhD**  
Associate Professor, Physical Science and  
Chemistry  
Co-Chairman, Division of Engineering and  
Physical Science

**Johnson, Blaine, BS, MA, EdD**  
Associate Professor, Music and Education  
Coordinator of Military Affairs

**Jones, Eulalia B., BA**  
Assistant Professor, Library Science  
Assistant Librarian

**Kupfer, Vern K., BS, MS**  
Associate Professor, Psychology and Social  
Science  
Coordinator, Health and Counseling Service

**Larsen, Wesley P., BS, MS, PhD**  
Assistant Professor, Biological Science

**LeBaron, George L., BS, MS**  
Associate Professor, Physics and Physical  
Science

**Magleby, V. R., BS, MS**  
Associate Professor, Agriculture and Biology

**Matthews, Darrel H., BS, MS**  
Associate Professor, Animal Husbandry

**Maxfield, Flora Lee, BS**  
Instructor, Family Life

**McAllister, LeRay L., BA, MS**  
Assistant Professor, Business

## College of Southern Utah

**Braithwaite, Royden C., BS, PhD**  
Director  
Professor, Psychology and Education

**Adams, Fred C., BA, MA**  
Instructor, English and Speech

**Ashcroft, Theron, BS**  
Professor of Physics and Engineering  
Co-Chairman, Division of Engineering and  
Physical Science

**Barrus, George S., BS**  
Assistant Professor, Journalism  
Chairman, Information Services

**Carpenter, Ada D., BS**  
Assistant Professor, Family Life  
Chairman, Division of Family Life

**Challis, A. Thomas, BA, MS**  
Assistant Professor, Library Science  
Chairman of Library Services

**Clark, Gwyn R., BS, MS**  
Associate Professor, Elementary Education  
Supervisor of Teacher Training

**Cloward, McRay, BS, EdM, EdD**  
Coordinator of Housing  
Associate Professor, Education and Social  
Science

**Cooley, Hazen, BS, MBA**  
Secretary and Treasurer  
Professor, Business

**Cooper, Laurence C., BS, MS**  
Assistant Professor, Chemistry and Phys-  
ical Sciences

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\*On leave.

**Moss, Steven A., BS, MS**  
Instructor, Mathematics and Physical Science

**Myers, Kent, BS, MED**  
Assistant Professor, English and Speech  
Coordinator of Auditorium Activities

**Ogden, Phil R., BS, MS**  
Assistant Professor, Range Management

**Osborne, Bruce H., BS**  
Assistant Professor, Physical Education  
Athletic Coach

**Petty, Cleo M., BS, MS**  
Assistant Professor, Physical Education  
Athletic Director, Coach

**Plummer, J. H., BA, MA**  
Associate Professor, English  
Dean of Instruction

**Robb, Ward S., BS**  
Registrar  
Assistant Professor

**Roper, Melvin J., BS**  
Instructor, Industrial Education

**Rowley, Richard M., BS, MA**  
Associate Professor, English and Speech

**Schmutz, D. Clarence, BA, MA**  
Associate Professor, Agricultural Economics  
Chairman, Division of Agriculture, Biological Science and Forestry

**Shirts, Morris A., BA, MS, EdD**  
Associate Professor, Education  
Chairman, Summer Session

**Southwick, Elaine C., BA**  
Instructor, English and Speech

**Stephenson, A. W., BS, MBA**  
Associate Professor, Business  
Chairman, Division of Business and Social Sciences

**Stout, Shirley G., BS**  
Instructor, Secretarial Science

**Thompson, Richard A., BA, MA, PhD**  
Assistant Professor, History and Social Science

**Vorkink, Paul, BS, MED**  
Assistant Professor, English and Speech

**\*Wahlquist, A. Glenn, BS, MS**  
Associate Professor, Agronomy and Biology

**Weaver, Max D., BS, MS**  
Associate Professor, Art

**Whetten, LaVeve, BS**  
Assistant Professor, Physical Education

**Woolf, Eugene T., BA, MA**  
Assistant Professor, English and Speech

## Other Members of Staff

**Applegate, Elverda**  
Supervisor, Women's Residence Hall

**Applegate, George Blaine**  
Bookkeeper

**Bushnell, Van L.**  
Cashier and Band Director

**Cox, Carl T.**  
Valley Farm Assistant

**Cox, R. Reid**  
Chairman of Plant Operations

**Draper, Carol, RN**  
Nurse, Health and Counseling Center

**Evans, Gayle, BS**  
Superintendent of Valley Farm

**Grant, Sheldon**  
Superintendent of Grounds

**Jackson, Douglas**  
Assistant Superintendent, Building and Maintenance

**Matheson, Edward G.**  
Superintendent of Heat Plant

**Miller, Joyce**  
Office Assistant

**Nelson, Barbara B.**  
Assistant Registrar

**Rigby, Eldro**  
Assistant, Buildings

**Roberts, Joseph W.**  
Superintendent of Buildings

**Slack, F. Gordon**  
Office Assistant

**Smith, T. Gordon**  
Valley Farm Assistant

**Stratton, H. Arwin**  
Assistant, Buildings

## Associated Instructors

The elementary teachers of Iron County School District serve as critic teachers in the Division of Education.

**Dahl, Paul E.**  
Director, LDS Institute of Religion

\*On Leave.



## 326 Faculty

**Day, Frank**  
Associate Director, LDS Institute of Religion

**Harman, Rev. E. R.**  
Director, Newman Study Hall (Catholic Center)

**Johnson, Mrs. Blaine**  
Special Instructor in Music

**Jones, Bernella**  
Special Instructor in Music

**Thorley, Max J.**  
Special Instructor in Music

**Jennings, Bruce, BA, MA**  
Assistant Professor of English

**Jensen, Halbert, MBA**  
Instructor of Business Administration

**Jensen, LaVar**  
Piano Instructor

**Kay, J. Gwendolyn, BS**  
Instructor, Home and Family Living

**Mangelson, Farrin L., BS, MS**  
Associate Professor of Chemistry

**Moore, Blain, AB, MA**  
Assistant Professor of Biology

**Olsen, Ruth, BS**  
Librarian  
Instructor in Library Science

**Peterson, Rulon, BS**  
Instructor of Mathematics

**Phillips, Lucy A., AB, MA**  
Professor Emeritus of English

**Ray, Nellie, BS, MA**  
Associate Professor of Secretarial Science  
Acting Chairman, Division of Business

**Ryan, Duane, AB, MA**  
Instructor in Speech

**Stoddard, Robert, BS**  
Instructor in Physical Education and Agriculture

**Stout, Clayton**  
Instructor in Automotive Technology

**Takasaki, Fred Y., BA, MA**  
Instructor of Art

**Thompson, Lee R., BS**  
Treasurer  
Assistant Professor of Physical Education

**Woodbury, Darwin, BS**  
Instructor of Physical Education

## Other Members of Staff

**Stout, Fonda**  
Manager of Bookstore

**Olsen, Goldie**  
Manager of Cafeteria

**Peterson, Hillmer**  
Supt. Buildings and Grounds

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