Utah State University

Founded at Logan in 1888

LAND-GRANT UNIVERSITY CENTENNIAL 1862-1962

USU DIAMOND JUBILEE 1888-1963

1962-63 Catalog
USU Calendar, 1962-63

Summer Quarter, 1962

June 11, Monday  
First Session Begins
July 13, Friday  
First Session Ends

July 16, Monday  
Second Session Begins
August 17, Friday  
Second Session Ends

Fall Quarter, 1962

September 10, Monday  
All Staff on Campus
September 12, Wednesday  
General Staff Meeting
September 13, Thurs.; 14, Friday  
Utah Conference on Higher Education
September 17, Monday  
University Faculty Meeting
September 22, Sat.; 23, Sunday  
Orientation, New Students
September 24, Monday  
Registration, New Students
September 25, Tuesday  
Registration, Former Students

October 16, Tuesday  
Last Day for Changing Registration
October 27, Saturday  
Homecoming
November 22, Thurs.; 23, Friday  
Thanksgiving Recess
December 10, Monday  
Classwork Ends
December 11-14, Tuesday-Friday  
Final Examinations

Winter Quarter, 1963

January 2, Wednesday  
Orientation, New Students
January 2, Wed.; 3, Thurs.  
Registration
January 4, Friday  
Class Instruction Begins
January 7, Monday  
Late Registration Fee Effective

January 24, Thursday  
Last Day for Changing Registration
March 12, Tuesday  
Classwork Ends
March 13-16, Wednesday-Saturday  
Final Examinations

Spring Quarter, 1963

March 19, Tues.; 20, Wed.  
Registration
March 21, Thursday  
Class Instruction Begins
March 22, Friday  
Late Registration Fee Effective
April 10, Wednesday  
Last Day for Changing Registration
May 29, Wednesday  
Classwork Ends

May 30, Thursday  
Holiday
May 31, Friday; June 1, Saturday;  
June 3, Monday; June 4, Tuesday  
Final Examinations
June 4, Tuesday  
Baccalaureate
June 5, Wednesday  
Commencement

Summer Quarter, 1963

June 10, Monday  
First Session Begins
July 12, Friday  
First Session Ends

July 15, Monday  
Second Session Begins
August 16, Friday  
Second Session Ends
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Utah State University Board of Trustees

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Logan

N. D. Salisbury
Logan

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Provo
Vice Chairman

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Dean, School of Graduate Studies

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Director, University Research

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Dean, College of Engineering

Director, Agricultural Experiment Station

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Dean, College of Family Life

William H. Bennett
Director, Extension Services

J. Whitney Floyd
Dean, College of Forest, Range and Wildlife Management

Director, Cooperative Extension Service

Milton C. Abrams
Librarian

H. B. Hunsaker
Director of Athletics
# University Departments of Instruction

<table>
<thead>
<tr>
<th>Department</th>
<th>Department Head</th>
<th>Office Location</th>
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<tbody>
<tr>
<td>Agricultural Economics</td>
<td>George T. Blanch</td>
<td>Ag Science 133</td>
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<tr>
<td>Agricultural Education</td>
<td>Stanley S. Richardson</td>
<td>Ag Science 15</td>
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<tr>
<td>Agronomy</td>
<td>Howard B. Peterson</td>
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<tr>
<td>Air Science</td>
<td>Lloyd R. Pugh, Jr.</td>
<td>MS 104</td>
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<tr>
<td>Animal Husbandry</td>
<td>James A. Bennett</td>
<td>Animal Ind. 307</td>
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<tr>
<td>Applied Statistics and Computer Science</td>
<td>Rex L. Hurst</td>
<td>Main 15</td>
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<tr>
<td>Bacteriology, Public Health</td>
<td>Lewis W. Jones (Acting)</td>
<td>Plant Ind. 310</td>
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<tr>
<td>Botany and Plant Pathology</td>
<td>Orson S. Cannon</td>
<td>Plant Ind. 201</td>
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<tr>
<td>Business Administration</td>
<td>Robert P. Collier</td>
<td>Main 181</td>
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<tr>
<td>Business Education and Office Administration</td>
<td>Robert E. Wiper</td>
<td>Main 376</td>
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<tr>
<td>Chemistry</td>
<td>Melvin C. Cannon</td>
<td>Widtsoe 111</td>
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<tr>
<td>Civil and Irrigation Engineering</td>
<td>Cleve H. Milligan</td>
<td>EPS 150</td>
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<tr>
<td>Clothing and Textiles</td>
<td>Haruko Terasawa (Acting)</td>
<td>Family Life 204</td>
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<tr>
<td>Dairy Industry</td>
<td>George E. Stoddard</td>
<td>Animal Ind. 101</td>
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<tr>
<td>Economics</td>
<td>Evan B. Murray</td>
<td>Main 315B</td>
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<td>Education</td>
<td>John C. Carlisle</td>
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<td>Electrical Engineering</td>
<td>Larry S. Cole</td>
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<td>King Hendricks</td>
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<td>Family and Child Development</td>
<td>Don C. Carter</td>
<td>Family Life 118</td>
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<td>Fine Arts</td>
<td>Twain Tippetts</td>
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<td>Food and Nutrition</td>
<td>Inez L. Schoulte</td>
<td>Fam. Life 104-D</td>
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<tr>
<td>Forest Management</td>
<td>J. Whitney Floyd</td>
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<tr>
<td>Geology</td>
<td>J. Stewart Williams</td>
<td>Main 182-F</td>
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<td>Health, Physical Education and Recreation</td>
<td>H. B. Hunsaker</td>
<td>Smart Gym 26</td>
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<td>History and Political Science</td>
<td>M. R. Merrill</td>
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<td>Homemaking Education</td>
<td>Virginia H. Harder</td>
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<td>Horticulture</td>
<td>Leonard H. Pollard</td>
<td>Ag Science 204</td>
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<td>Household Economics and Management</td>
<td>Edith Nyman</td>
<td>Fam. Life 204-B</td>
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<td>William E. Mortimer</td>
<td>Mech. Arts 105</td>
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<td>Landscape Architecture and Environmental Planning</td>
<td>Laval S. Morris</td>
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<tr>
<td>Languages</td>
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<td>Mathematics</td>
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<td>Poultry Husbandry</td>
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<td>Arden N. Frandsen</td>
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<td>Sociology and Social Work</td>
<td>R. Welling Roskelley</td>
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<td>Speech</td>
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<td>Merthyr L. Miner</td>
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<td>Wildlife Resources</td>
<td>William F. Sigler</td>
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<tr>
<td>Zoology</td>
<td>Datus M. Hammond</td>
<td>FBS 105</td>
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</table>
Tuition and Other Fees

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

Resident Students

<table>
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<tr>
<th></th>
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<th>Second Quarter</th>
<th>Third Quarter</th>
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<tr>
<td>Tuition and</td>
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<td>Athletic Fee</td>
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<td>Alumni Fee</td>
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<td>Total Fees</td>
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Non-Resident Students

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<th>Third Quarter</th>
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<td>Building Fee</td>
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<td>Studentbody Fee</td>
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<td>Athletic Fee</td>
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<tr>
<td>Class Fee</td>
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<td>Alumni Fee</td>
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<td>Total Fees</td>
<td>$126.50</td>
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Special Fees

**Application Evaluation Fee** $5.00

This fee will be applied on tuition when student registers at the University.

**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.

**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**

<table>
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<tr>
<th>Part</th>
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<tr>
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<td>3.50</td>
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<tr>
<td>2</td>
<td>5.50</td>
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**Graduation Fee** 5.00

**Teacher Supervision Fee** 25.00

**Teacher Placement Fee** 5.00

**Teacher Placement re-registration** 2.00

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

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

**Transcript of Credits.** Each student is entitled to one transcript free.

**Additional transcript (Extra copies 25c)** 1.00

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

**Note fee, on individual loans** 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 Arts—**

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—**

<table>
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<th>Problem</th>
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<tr>
<td>Forestry</td>
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<tr>
<td>Range Management</td>
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<tr>
<td>Wildlife Management</td>
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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:**

<table>
<thead>
<tr>
<th>Lesson per week (10 lessons) per Quarter (1 credit)</th>
<th>Fee</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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</table>

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 students have presented the fee card at the Cashier's Window, office of the Controller, and have paid fees, and filed the registration cards with the Registrar's Office.

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

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

Utah State University
Photographs

on following eight pages

(Photos by Arlen L. Hansen)
For several months of the year Aggie Acres becomes a winter fairy land. Snow sculpturing, 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 Bear...
Many a lasting friendship is formed in strolls across the broad expanse of lawn known as the Quad. Across the Quad can be seen a rear view of Old Main, which faces out across Logan City and Cache Valley to the west.
Social center of the campus is the Student Union Building. A proper balance between study and play is important.
Television is becoming increasingly important as an educational medium. USU has one of the best Radio-Television studios of any university in the world.
Agricultural Science Building houses College of Agriculture, University Research Division, Agricultural Experiment Station, Extension Services and Summer School offices.
The University has several residence halls to accommodate its growing student body. Here is one of several new dorms constructed adjacent to the campus of the LDS Church.
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. This 1962 year is the Centennial of the Land-Grant University system.

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, flocks, 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
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 eight 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 appointed in 1954. Previous presidents, and the year of their appointment, have been as follows:

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 a member of the American Society for Engineering Education, Engineering College Research Council and Engineering College Administrative Council. Its curricula in civil engineering, electrical engineering and mechanical 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 Science 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; REFERENCE LIBRARIAN Ida-Marie Logan; ASSISTANT REFERENCE LIBRARIANS Karlo Mustonen¹, Anna Marie Smith; CIRCULATION LIBRARIAN Ann M. Caine; CATALOGING LIBRARIAN Dixie Drage; SERIALS LIBRARIAN Jeanne Chapin; 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 student body. 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.

¹On leave.

(III) Resources of the Library include: (A) Approximately 300,000 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.
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, a class is attended 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 Graduate courses; that is, courses taken by Graduate students.

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

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

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

At the end of each course description are listed the number of credits given for the course, the quarter/s it will likely be taught, and the name of the instructor. The credits and the quarter/s it will be taught are indicated in abbreviated form in parentheses. For example: (3F) indicates that the course offers three credits and will likely be taught Fall Quarter. (5F, W, 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 a student has to take the class all four quarters, but rather
that he has his choice of any quarter. In some cases, such as $(5F, W, S)$ 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, one should refer to the Class Schedule published just prior to the beginning of each new quarter. All Catalog listings are subject to change.

Occasionally two or more closely related courses will be listed under one entry, such as English 1. 2. 3. 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 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 students 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 one wishes to devote to it. Five is the maximum number of credits that may be earned unless otherwise specified.

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

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Office of

Admissions and Records

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

Office in Main 131

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

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

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

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

(4) **University Records IBM.**

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

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

(7) **Veterans' Affairs.**

(8) **Statistics:** Periodical reports; special reports.
Admission: Entrance Requirements

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

Effective with the publication of the 1962-63 catalog, a fee of $5.00 will be charged for the evaluation and processing of each undergraduate and graduate application for admission to Utah State University. If the applicant enrolls at the University, this $5.00 fee will be credited towards his tuition. If the applicant fails to enroll at USU, the fee will be forfeited.

Students 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 his application is received after this deadline but prior to registration day, a student will be scheduled to register after the regular registration schedule is completed.

If one registers late as a result of late application he is 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.

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

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

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

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

Even though a student is not a high school graduate he 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 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. A student who fails to submit transcripts from all institutions, previously attended, is liable to suspension from the University.

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

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 to be substituted.

Students who transfer to Utah State University after having had one or more quarters of college work at another accredited institution will be accepted in good standing if they have a cumulative grade point average of 2.0 (C) or better. Exceptions may be made by the Academic Standards Committee. Test scores, recommendations of counselors and others, and experience in non-academic pursuits will be considered. Students who have a grade point average below 2.0 will be admitted only upon recommendation of the Academic Standards Committee.

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

Readmission. Former students of
Admissions and Records

the University returning after an absence of one or more quarters are required to file applications for re-admission 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, students are permitted to register according to an alphabetical schedule to be announced later.

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

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

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

The program of courses listed on the registration card, approved by the dean and filed in the Office of Admissions and Records, is the official registration for the quarter. Students are held responsible for the satisfactory completion of the entire program unless an official change-of-registration form is filed with the Office of Admissions and Records. An “F” grade will be recorded in case of failure to obtain a passing grade or an incomplete in any course for which students are registered, regardless of the reason for the failure.

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

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

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

During the first three weeks of any academic quarter registration may be changed on the student's own initiative, he may add or drop classes by obtaining the approval of the teacher concerned, the faculty adviser, and the dean of his college, so indicated by their signatures on the change-of-registration form.

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

A student may add classes up to and including the end of the second week of each quarter and he may be permitted to drop classes up to and including the end of the third week of each quarter.

After the third week changes in registration may be made only for extraordinary reasons beyond the control of the student and upon initiation of the dean of the college in which the student is registered. Students who have valid reasons for changing registration after the third week should discuss them with the dean.

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

Change-of-Registration Fee. No charge for the first five days. $1 for each class change made thereafter.

Procedure for Dropping Classes or Withdrawing from the University After the Third Week of the Quarter. If for any reason it is necessary to leave the campus before the end of the quarter, take the necessary steps to withdraw from the Institution officially.

Dropping Classes, (1) Obtain change of registration card from Office of Admissions and Records; (2) Obtain the signature and recommendation of the adviser. (3) Obtain the signature and recommendation of the dean. (4) Pay change fee at Controller's Office. (5) Take card to instructor for signature and grade. (6) Instructor returns card to dean who sends it to the Office of Admissions and Records.

Withdrawal from the University. (1) Obtain withdrawal forms from the Office of Admissions and Records. (2) Obtain the following signatures on Withdrawal Interview Record card: (a) faculty adviser (b) dean of college (c) Office of Veteran's Affairs (if applicable). (3) Pick up yellow class card from each instructor. (4) Return to the Office of Student Services for termination interview. (5) Take class cards, Withdrawal Permit, and Withdrawal Notice to the Office of Admissions and Records. (6) Take Withdrawal Notice to Controller's Office for refund.

Students, who withdraw after the third week of the quarter, will have grades of WP (passing) or WF
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(failing) recorded on their official records.

Visitor's Permit. If students wish to attend regularly any class for which they are not registered they must obtain a visitor's permit from the Office of Admissions and Records. No credit will be allowed for such attendance. 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 admittance 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 students the privilege of attending classes if they have not complied with regulations for admission to classes.

Normal Registration. Fifteen credits, exclusive of two credits in basic Military Science or 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 the student is registering has authority to approve registration in excess of this maximum. A student is not allowed to register for less credit than that listed for a course in order to bring the total registration within the maximum limit as herein defined. No credit arranged may exceed five credits unless otherwise specified. The registration is construed to include any extension, correspondence, institute, or other work carried for credit, or for removal of high school deficiencies, during the period of the school year.

Minimum Registration. The minimum registration for a full-time student load is considered to be twelve credit hours. To be eligible for student body offices students 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 carry fifteen credits per quarter.

Incomplete Work. Students are required to complete by the end of the quarter all courses for which they have registered. This includes correspondence courses 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 the dean’s office. Incomplete work must be finished, and a passing grade given in the course, within one year of the close of the quarter; otherwise the credit is forfeited.

**Low Scholarship and Probation.**

If a student has not maintained an average grade of “C” or better, or if he is failing to obtain passing grades in twelve or more credits during the preceding quarter, he is 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 student body 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 guardians will be notified of the probationary status by the Dean of Students 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 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 Special Examination.** In special cases, students may be permitted to obtain university credit by passing examinations in subjects not taken in classes. Credit for a subject taken in a course for which a grade other than passing has been received cannot be acquired by means of special examination. This privilege does not permit the combination of “visiting” or “auditing” a class with a request for a special examination as a means of acquiring credit. Neither does it contemplate outside assignments or outlines on the part of the instructor being combined with an examination to acquire credit. This privilege is intended to measure information and training gained from practical experience that may be considered the equivalent of the experience and training received by students in an organized course given in the University.

A maximum of 18 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 a student enrolls, the credits gained will be included as part of the 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.
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 for the major work upon which a student 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.

To become a candidate for the Bachelor of Science degree a student should plan courses with great care through consultation with faculty adviser, major professor, and dean, to 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 the following requirements should be satisfied:

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:


         3. Any two of the following three series:

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

   If a student already has a satisfactory knowledge of general biol-
ogy, as demonstrated by examination, he may satisfy this group requirement by taking Bacteriology 10 or 70 and 71 and Physiology 4 or 30.

(2) Exact Science.
Chemistry—any course of Lower Division grade.
Geology 1 or 3 or 31, 4, 5.
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. Credit will not be given for both Math 24 and 34.
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 Latin or in any modern foreign language offered in the University.
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 Arts should see the introduction to the College of Humanities and Arts 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 a student transfers from one of these divisions, he is 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 they change from a prescribed course to a major under the group elective system they must complete the basic group requirements as specified in the section on the Lower Division. Transfer students who continue in a prescribed course will be held for the completion of the Lower Division courses as prescribed at USU, except as equivalent courses may be accepted as substitutes for our own courses.

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

**Major Subject.** Students should select a major subject upon entering the University or early the first year, but not later than entrance in the Upper Division. As soon as the major subject has been selected, he should consult the head of the department in which he has decided to major. The head of the department will assign an adviser. Registration in each succeeding quarter should be carefully checked and approved by the adviser (called the major professor) to assure proper selection and sequence of courses for satisfying institutional and departmental requirements.

Major departments have the authority to prescribe not fewer than 30, and not more than 50, credits in the major subject (exclusive of any courses which may have been used to satisfy Lower Division requirements in any of the groups). Major departments and the deans of the colleges shall also prescribe such other related courses as may be considered desirable, provided always that 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 students successfully pursue further prescribed work in one of these fields for an additional year at an approved institution, they may be granted a Bachelor of Science degree by this University. Students need not comply with general major-minor requirements as previously outlined.

**Minor Subjects.** Students are permitted to choose their own minor. The minor consists of 18 credits either in one department or in two departments closely related in subject matter, provided that a minor
taken in more than one department has the approval of the dean and the major professor. Courses used to satisfy the English composition, the basic groups, Military Science, 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 Business Administration, Master of Education, Master of Forestry, Master of Industrial Education, 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 candidates for a certificate, a diploma, or a degree, are held to compliance with such changes, so far as the uncompleted part of the course is affected.

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

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

Two-Year Certificate

The Colleges of Agriculture, Engineering, Business and Social Sciences, and Humanities and Arts offer two-year courses in practical studies leading to a certificate of completion for those who are not interested in the regular four-year course leading to the B.S. degree.

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

To qualify for a Certificate:

(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 eight resident colleges.

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

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

Summary of Graduation Requirements

For students who will graduate at the next commencement, the following additional requirements must be met after the requirements-for-admission have been satisfied. Responsibility for satisfying the requirements for graduation rests upon the student.

(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, they must present one credit of other work for each quarter they have been exempt.

ROTC is a four-year program consisting of two two-year courses: Basic and Advanced. Entrance into the Basic Course is elective, admission to the Advanced Course is both elective and selective. Upon entering either course, completion thereof becomes a prerequisite for graduation, unless one is discharged in accordance with the provisions of Army Regulation 145-350 or Air Force Regulation 45-48 and AFROTC Manual 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.
(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) No more than 108 hours of transfer credit will be accepted toward graduation from junior colleges.

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

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

(12) 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.

(13) 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 he fails to file application for graduation by May 1 he will be held over to the next year's commencement.

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

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

(16) Second Bachelor's Degree. A student who wishes to qualify for a second Bachelor's degree must complete a minimum of 45 credit hours beyond those required for the first degree. He must, also, meet the requirements of the major department.
College of Agriculture

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Degrees Offered:
Bachelor of Science
Master of Science
Doctor of Philosophy
Agriculture today is a dynamic, rapidly changing industry. There are few fields of work that can offer such interesting and challenging opportunities. Agriculture includes much more than farming or producing food and 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 students unlimited opportunities. But it is highly competitive and to be fully successful one must be well trained.

There are seven departments in the College of Agriculture: Agricultural Economics, Agronomy, Animal Husbandry, Dairy Industry, Horticulture, Poultry, and Veterinary Science.

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

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

- 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.

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

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

- Become a successful farmer or rancher.

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

- Become a conservation specialist, to help conserve and rebuild our natural resources.
34 College of Agriculture

- Become a leader in the community in which he lives so he can intelligently serve his fellowmen and fulfill his obligations as a citizen of a free world.

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

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

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

Facilities and Equipment

The Departments of Agricultural Economics, Agronomy, Horticulture, and Agricultural Education are also housed in this building, where modern class rooms and well equipped laboratories are available for teaching and research.

The Animal Husbandry, Dairy Industry and Poultry Husbandry Departments are housed in the Animal Industry Building.

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. This farm is being taken over by married student’s housing. A new Animal Husbandry Farm, located five and a half miles south of Logan, has been purchased. This will be developed during the next two or three years.

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

Students 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 a candidate for graduate work in one of the basic agricultural sciences and for a career in scientific or technical agriculture. He may select between Biological Science or Applied Science (Animal Science, Plant Science, Applied Statistics).

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

(3) General Agriculture, which will give a broad, general training in scientific and practical agriculture and prepare a student 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 the student to become an agricultural teacher.

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

Agricultural Science

(a) Biological Science

<table>
<thead>
<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>Exact Science</td>
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<tr>
<td>Biological Science</td>
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<tr>
<td>Social Science</td>
</tr>
<tr>
<td>Language and Arts</td>
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<tr>
<td>Basic Communications</td>
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<tr>
<td>P.E. or M.S.</td>
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</tbody>
</table>

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. The department decides what additional courses are required.


<table>
<thead>
<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>Exact Science</td>
</tr>
<tr>
<td>Biological Science</td>
</tr>
<tr>
<td>Language and Arts</td>
</tr>
<tr>
<td>Social Science</td>
</tr>
<tr>
<td>Basic Communications</td>
</tr>
<tr>
<td>P.E. or M.S.</td>
</tr>
</tbody>
</table>

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

1 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.

2 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

<table>
<thead>
<tr>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Exact Science</td>
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<tr>
<td>Biology</td>
</tr>
<tr>
<td>Social Science</td>
</tr>
<tr>
<td>Language and Arts</td>
</tr>
<tr>
<td>M.S. or P.E.</td>
</tr>
<tr>
<td>Basic Communications</td>
</tr>
<tr>
<td>Electives</td>
</tr>
</tbody>
</table>

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

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

4 In addition to the courses listed above Zoology 1 and Physiology 4 will be allowed.
General Agriculture

Two-Year Program In Agriculture

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

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

Students 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.

To obtain a certificate, 96 credits must be completed.

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 in college.

Department of Agricultural Economics


Office in Agricultural Science 133

Agricultural Economics is a study of economic and business principles and problems involved in producing and marketing agricultural products. A well trained Agricultural Economist becomes 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. This will include the successful operation of a 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. The requirements for the B.S. degree may be satisfied under either the Agricultural Business or the General Agriculture Curriculum. The choice of the curriculum to follow need not be made before the beginning of the Junior year since the courses recommended for the Freshman and Sophomore years are the same for both.

Graduate Study

Master of Science Degree. There are 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. The M.S. degree is accepted by other universities as work done toward the Ph.D. degree. 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.

**Freshman and Sophomore Years**

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

<table>
<thead>
<tr>
<th>Area of Work</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Commun.</td>
<td>9</td>
</tr>
<tr>
<td>Language and Arts</td>
<td>8</td>
</tr>
<tr>
<td>Exact Science¹</td>
<td>23</td>
</tr>
<tr>
<td>Biological Science²</td>
<td>15</td>
</tr>
<tr>
<td>Social Science²</td>
<td>10</td>
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<tr>
<td>P.E. or M.S.</td>
<td>6-9</td>
</tr>
<tr>
<td>Agricultural Production</td>
<td>9</td>
</tr>
<tr>
<td>Agricultural Economics</td>
<td>9</td>
</tr>
<tr>
<td>Economics and Business Adm.</td>
<td>8</td>
</tr>
</tbody>
</table>

¹Math, Chemistry
²Botany, Zoology, Bacteriology
³To be selected from History, Political Science, Psychology, Sociology.

**Junior and Senior Years**

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

(a) General Agriculture

<table>
<thead>
<tr>
<th>Area of Work</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Economics</td>
<td>25</td>
</tr>
<tr>
<td>Economics</td>
<td>18</td>
</tr>
<tr>
<td>Business Administration</td>
<td>10</td>
</tr>
<tr>
<td>Agricultural Production</td>
<td>12</td>
</tr>
<tr>
<td>Irrigation and Drainage</td>
<td>3</td>
</tr>
</tbody>
</table>

(b) Agricultural Business

<table>
<thead>
<tr>
<th>Area of Work</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Economics</td>
<td>25</td>
</tr>
<tr>
<td>Economics</td>
<td>18</td>
</tr>
<tr>
<td>Business Administration</td>
<td>20</td>
</tr>
</tbody>
</table>

**Agricultural 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)  

Morrison

*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)  

Staff

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)  

Davis

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. (3W)  

Anderson

*Taught 1962-63.

**Taught 1963-64.
**186. Land Problems and Appraisal.** The application of economic principles and techniques to the appraisal, conservation and development of land and water. (3S) **Staff**

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**

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**

*Taught 1962-63.*

**Taught 1963-64.**

**Department of Agronomy**

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


**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 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

A major in Agronomy prepares 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 students should take Ag. Econ. 71, 72, and 73 (nine hours, or the equivalent); Ag. Eng. 10 or 110; Agronomy (Crops) 7, 8, 103, 109, 112, 118, and 120; Agronomy (Soils) 56, 107, 111, 114, and 155; Animal Sciences six hours (three hours in each of two departments); Bacteriology 10, or 70 and 71; Botany 24, 25, and 120 or 130; Chemistry 10, 11, and 12; Entomology 108; Gen. Agric. 1; Geology 3; Horticulture, three hours; Math 24, 25, and 26, or Math 34, 35, and 44, or 46; and Zoology 112.

Crop Science

A major in Crop Science is 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 students have special aptitudes in the fundamental sciences and are interested in plant sciences they will find unlimited opportunities in this field.

In addition to the general University group requirements students should take Ag. Eng. 10 or 110; Agronomy (Crops) 7, 8, 103, 109, 112, 118, and 120; Agronomy (Soils) 56, 107, 111, and 155 or 165; Appl. Stat. 131 and 132; Bacteriology 70 and 71; Botany 24, 25, 30, 120, and 130; Entomology 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); Geology 3; and any upper division Math, Chemistry, Physics, or Geology courses authorized by the major department; and Zoology 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: Botany 24. (4F, S) Allred

   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)
   Tinge

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

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: Agronomy 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

Soils Courses

   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, W)
   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. Four lectures, one lab. (3S)
   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: Agronomy 56, or 58, 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: Agronomy 56 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: Agronomy 56 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. Prerequisite: Agronomy 165. 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

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: Agronomy 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: Agronomy 155 and 224. (2W) Miller and Smith

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

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: Agronomy 7 and 56. (2S) McAllister

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

218. Special Problems. Crop production, crop breeding, soil fertility, or other phases of agronomic work. Students 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

*Taught 1962-63.
**Taught 1963-64.
Department of

Animal Husbandry


Office in Animal Industry 307

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

A major in Animal Husbandry 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 to be a livestock operator, a ranch manager, a county agent, or to take a position related to livestock raising with various other state and federal agencies.

Suggested Course of Study

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<tr>
<th>Course</th>
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<td>Dairy or Poultry</td>
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<td>Agronomy 103</td>
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<td>Irrigation and Drainage 10 or 110</td>
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<td>Electives</td>
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Applied Science Curriculum

During the freshman and sophomore year, students 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; Agronomy 56, 103, or Range Management 160; An. Hus. 2 or 165, 50, 41, 42, 150, 151, 155, 160; Chemistry 190; V. S. 20, Zoology 112.

To specialize in nutrition students should also complete either Physiology 121 and 122 or Chemistry 121, 122 in addition to Chemistry 3, 4, 5, and 115.

Two-year Program in Animal Husbandry

A two-year practical course is available to train students for efficient livestock production. If one does 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
Agronomy 56, 103 or Rge. Mgt. 160 .............................................. 8
Ag. Econ. 71, 72, 73 ......................................................................... 9
An. Eng. 1, 10, 102, 103 ................................................................. 19
Welding 91 .................................................................................... 5
English 1, 2, 3 .............................................................................. 9
Math 34 ....................................................................................... 3
P.S. 10, Sociology 10 or 70 .............................................................. 10
P.E. and Electives ........................................................................... 13

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.)

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. Livestock 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) Foote

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) Foote

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 con-
201. Problems in Animal Breeding. Readings, discussions and lectures concerning genetic facts and theories as related to animal breeding. Prerequisite: A.H. 155. (3W) Staff

210. Techniques in Nutrition Research. An original project is completed with the primary objective being to orient one on how to plan, conduct, and summarize research in animal nutrition. Prerequisite: A.H. 150. (2-6F, W or S) 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) Staff

229. Animal Breeding Research. Students outline a problem, make a critical review of pertinent literature, collect, analyze necessary data, and prepare a report of their 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) Staff

240. Animal Nutrition Research. Same as A.H. 230, except that research is in some phase of animal nutrition. (2-5F, W or S) Staff

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) Staff

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 1963-64.
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 Professors R. C. Lamb, Charles H. Mickelsen; Research Assistant LaMon Perkes; Collaborators Melvin J. Anderson, Dave Kopland.

Office in Animal Industry 101

The courses in Dairy Industry offer a general curriculum for a bachelor of science degree, and an applied science or biological curriculum if one plans 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. Students may work on a Master of Science or a PhD degree in the Animal Nutrition and Biochemistry Interdepartmental Curriculum.

Dairy Production

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

Students 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, 150; 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, Agronomy 7, 118; Animal Husbandry 155, Agricultural Engineering 101; Agricultural Economics 102, Entomology 108; Business Administration 20.

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

Students 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;
Dairy Industry 47

Chemistry 3, 4, 5, 190; Physics 6; Veterinary Science 20, 120, 150; 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 students may specialize in one of three areas: (1) nutrition, (2) breeding or (3) physiology. To specialize in one of these areas students 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 51; Math 44 or 46, 97, 98, 99; (3) physiology—Chemistry 115, 121 and 122; Physiology 121, 122, 141; Zoology 118.

Dairy Manufacturing

General Curriculum. This course will prepare students for commercial dairying to be a plant operator, an equipment and supply technician, a grader, or a sanitary supervisor.

In addition to the general University and College of Agriculture requirements they will be required to take: Chemistry 190, 108; Bacteriology 104, 105; Business Administration 20, 63, 156; Dairy Industry 5, 6, 101, 103, 104, 105, 110, 215, 254.

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

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

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


**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. (6S) 

*103. Manufacture of Cheese.** Factors involved in making cheddar and other varieties of cheese. Classification, statistics, curing, marketing, and factory organization. (6F) 

*104. Concentrated Milks and Butter.** 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)
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. (5S) 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: Zoology 112. (5W) Stoddard

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

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. Students' 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 1962-63.

**Taught 1963-64.

**Department of Horticulture**

(Foriculture, Food Technology, Pomology, Vegetable Crops)


Office in Agricultural 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 the student for a position as an agricultural exten-
sion 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 the following courses are required to satisfy department requirements for a BS degree: Agronomy 56; Bacteriology 10 or 70, 71; Botany 24, 25, 120 and 130; Chemistry 10, 11, and 12; Entomology 108; Horticulture 1, 2, 4, 11, 131, 153 and department prescribed courses depending on specialization; Math 35 and 44 or 46; and Zoology 112.

Horticultural Science

The horticultural science curriculum prepares the student 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 the following courses should be taken in addition to University and College of Agriculture requirements: Agronomy 56; Appl. Stat. 131 and 132; Bacteriology 70 and 71; Botany 24, 25, 120 and 130; Chemistry 3, 4, 5, 115, 121 and 122; English 111; Entomology 108; Horticulture 1, 2, 4, 11, 131, 153 and department prescribed courses depending on specialization; Math 35 and 44 or 46, 97, 98 and 99; Physics 17, 18, 19 or 20, 21 and 22; and Zoology 112.

Graduate Study

The Department offers work both for the Master of Science and Doctor of Philosophy degree in Horticulture in the areas of food technology, plant breeding and physiology. The outline of studies and the research program are adapted to the objectives of the individual student. The general requirements for these degrees are explained in the School of Graduate Studies. (Also see Catalog, School of Graduate Studies.)

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

*Taught 1963-64.
50 College of Agriculture

*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: Botany 24, 25 (Botany 120 may be taken concurrently); Chemistry 12 or 121; Agronomy 56; Horticulture 1 or 4. Three lectures, one lab. (4W, 4S) Hamson, Walker


**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: Horticulture 11; Botany 30, 120. Systematic study of plants grown by florists. Two lectures, one lab. (3S) 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: Botany 130, Entomology 108 or special permission. Three lectures, two labs. (SS) 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: Bacteriology 10 or 70 and 71; Chemistry 3, 4, 5, or 10, 11, 12; Botany 24, 26, 130; Horticulture 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 by canning, freezing, drying, pickling, and radiations, juices, concentrates, and syrups; packaging, organoleptic appraisal, quality control, and sales promotion. Prerequisites: Bacteriology 10 or 70 and 71; Chemistry 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: 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: Horticulture 101, 102; Agronomy 107; Botany 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 1962-63.

**Taught 1963-64.
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, Donald C. Dobson; RESEARCH ASSOCIATE Sherwin Atkinson; RESEARCH ASSISTANT Robert Warnick.

Office in Animal Industry 203

A major in Poultry Husbandry is 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, 151; Zoology 112 and Chemistry 190.

Graduate Study

The Department offers a Master of Science degree in Poultry Nutrition, in Poultry Breeding and in Poultry Management.

Suggested Course of Study

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<th>Course</th>
<th>FRESHMAN</th>
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<td>Math 35</td>
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<td>Agronomy 56</td>
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<td>Zoology 112</td>
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**Senior**

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Selected 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. (3F) Staff

2. **Laboratory Exercise in Poultry Production.** Laboratory exercises in practical problems of incubation, brooding, feeding, selection and marketing of chickens and turkeys. (1F) Staff

**104. Embryology and Incubation.** Emphasis on the embryology of the chick with consideration of problems involved in incubation and hatchery operations. Three lectures and one lab. (arr.) 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. (2W) Draper

**Taught 1963-64.**
**52 College of Agriculture**


**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. Prerequisite: 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)**

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

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

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

*Taught 1962-63.*

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**Department of Veterinary Science**

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

**Office in Veterinary Science Building**

Courses in this department are not designed to train individuals to become a veterinarian. Rather, some of the courses help round out training in the animal sciences. The advanced courses are for those in graduate studies in the animal sciences, biochemistry, zoology and bacteriology.

If one desires to study toward a degree in veterinary medicine (D.V.M.), he must have at least two years or preferably three of preveterinary training at some authorized college or university, completing the basic required courses. He should then apply for entrance into a school of veterinary medicine. Enrollment in veterinary schools is limited. If majoring in either bacteriology, zoology, animal husbandry, dairy husbandry, poultry husbandry, or chemistry, he is 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 a student is a Utah resident and has completed the preveterinary requirements, he must apply to the Utah Commission for certification to the three Western veterinary schools cooperating under the compact. He must also make an independent application to the schools of his choice. Acceptance
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

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 operation on animals. Three lectures, one lab. (4S) Smart

*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

200. Special Problems. Open to upper division or graduate students majoring in subjects related to Veterinary Medicine and who wish to study a particular phase of disease in animals. (1-3F, W, S) 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: Zoology 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 1962-63.
**Taught 1963-64.
College of Business
and Social Sciences
College of

Business and Social Sciences

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College of

Business and Social Sciences

Robert P. Collier, Dean

Office in Main 181

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, preparing men and women to take an active part in the main stream of our society so that our progress and prosperity will grow in the years ahead. At least a minimal introduction to social science is required of all students in the University. In addition, the five departments in the College offer the following majors:

The Department of Business Administration offers Accounting, Finance, Marketing, Personnel and Industrial Relations and Production Management. The Department of Business Education and Office Administration offers: Business Education and Office Administration. The Department of Economics of-
58 College of Business and Social Sciences

f childs a major in Economics. 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. The 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.

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 government worker, foreign service, juvenile court worker, criminologist, welfare worker, production manager, financial wizard, college professor, public administrator.

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

Department of

Business Administration

(Accounting, Finance, Marketing, Personnel and Industrial Relations, Product Management)


Office in Main 312

The basic objective of the first two years' 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:

<table>
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<tr>
<th>FRESHMAN</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Basic Communications</td>
<td>9</td>
</tr>
<tr>
<td>Biology 1</td>
<td>5</td>
</tr>
<tr>
<td>Physiology 4 (or other biological science)</td>
<td>5</td>
</tr>
<tr>
<td>Math 24, 25 and 26 or 34 and 35</td>
<td>9 or 8</td>
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<tr>
<td>Political Science 1 or 10</td>
<td>5</td>
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<tr>
<td>History, Sociology or Psychology 53</td>
<td>10</td>
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<tr>
<td>Approved Electives</td>
<td>3</td>
</tr>
<tr>
<td>P.E., M.S., or A.S.</td>
<td>3 - 6</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>48 to 52</strong></td>
</tr>
</tbody>
</table>
This program for the first two years includes few business courses and definitely stresses the social sciences and group requirements. Advisers can counsel students in the specific scheduling of these classes or in alterations of this basic program to fit a particular situation. This basic program will, however, fill all of the group requirements, physical education requirements, and lay a solid basis for later specialization in any field of the College.

After a broad foundation during the first two years' 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. A major in this area 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, Economics 165. *Senior year*: B.A. 121, 122, 127, 143, 149, 171, 181, Economics 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 financ-
duction. The program of study provides opportunities for initial development of managerial skills and attitudes emphasizing application to production work. Typical starting jobs for graduates are in procurement and materials control, production planning and control, quality control, cost control, and first line supervision. Required Courses: *Junior year:* B.A. 131, 132, 133, 134, 135, 151, 171, 181, TME 56. *Senior year:* B.A. 136, 137, 138, 149, 150, Economics 107, 125, 171, 172, 174, Sociology 158, Speech 109. Mathematics, science, and technology are recommended electives.

**Graduate Study**

The Department of Business Administration offers two graduate programs. 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.

**Business Administration Courses**

1. 2. 3. *Introductory Accounting.* Accounting concepts and techniques essential to an understanding of the operation of the business enterprise. Open to all students of Sophomore
standing or above. Business majors should take this course in their Sophomore year. (B.A. 1: 4F, W; B.A. 2: 4W, S; B.A. 3: 4F, S)

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, 2Su) 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, W, S) Bell


30. Business Mathematics. An introduction to the mathematics of business and accounting. Designed to be taken prior to or concurrently with the first quarter of Introductory Accounting. (3F, S) Staff

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, S) Staff

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) McIliff

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, abstractions of title, mortgages, wills. Courses 105 and 106 alternate with 107 and 108; 105 and 106 will be given in 1962-63. 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

113. Business Stimulation. Principles of Model Building and a simulation of actual business problems as practice in decision making. (2F, W) Bell

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. 16. 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

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. Three lectures. (3W) Staff

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

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. Prerequisites: B.A. 1, 2, 3, or B.A. 100. (3F, S, Su) 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, procurement, inventory control, 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. Prerequisite: TME 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. (5W) 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) Durtachi

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, Su) Neuberger, Lundstrom

147. Managing Small Business. Application of management principles and techniques to the independent, owner-manager type firm. (4W) Calder


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

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 conditions of our material welfare. Prerequisites: Marketing 151 and 152. (5S) Robinson

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) Dobler
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) Robinson

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. (3W) Staff

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) Staff

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)

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) Staff

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. (5S) 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: Economics 51, 52; B.A. 1, 2, 3. (5F, W, 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, Economics 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) Staff

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


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. (5S) Cannon

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

230. Business Research Methods. Methods and techniques of collecting, analyzing, and interpreting business data. (3F) Staff

250. Managerial Economics. The integration of economic theory with business practice and policies for the purpose of facilitating decision-making and forward planning. (3W) Durtschi

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, 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. Credit arranged. (S) Cannon
The dual Department of Business Education and Office Administration (formerly known as Secretarial Science) provides the students with an opportunity to pursue a degree that either prepares them to teach or to work in top-level office positions. The Business Education curriculum gives a broad background in the major field of business as well as allowing students to pursue a minor field of their choice. In addition they will be taking all necessary courses leading toward a teaching certificate as established by the Utah State Board of Education. In Office Administration students will have an opportunity to take all the courses needed to prepare them in the Secretarial field as well as pursuing a minor field of their own choice. This program will lead to a highly respected, top-level office position.

Graduate Study
The Department of Business Education offers courses leading to the Master of Science degree and provides a minor for the Doctor of Education degree. The program established will lend itself to a desirable working relationship with major professors and allow sufficient flexibility in the program to provide the necessary emphasis needed for individual research and development. Financial assistance is available to outstanding students in the form of graduate assistantships. See catalog, School of Graduate Studies for further information.

Business Education
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 advisers. 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.E., O.A., B.A.)
- minimum 60 hours
- Major 30-50 hours
- Minor (if desired) minimum 18 hours

Required Courses (R)
Suggested Courses (S)
### Freshman Year

#### Fall
- English 1, Basic Communications 3 R
- Biology 1 5 R
- B.A. 30 Business Math or Math Course 3 R
- S.S. 65 Records Administration 3 R
- S.S. 41 Elementary Type or equivalent 2 R
- P.E. or M.S. 1 R

<table>
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<tbody>
<tr>
<td>English 1, Basic Communications</td>
<td>3</td>
</tr>
<tr>
<td>Biology 1</td>
<td>5</td>
</tr>
<tr>
<td>B.A. 30 Business Math or Math Course</td>
<td>3</td>
</tr>
<tr>
<td>S.S. 65 Records Administration</td>
<td>3</td>
</tr>
<tr>
<td>S.S. 41 Elementary Type or equivalent</td>
<td>2</td>
</tr>
<tr>
<td>P.E. or M.S.</td>
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</table>

#### Winter
- English 2, Basic Communications 3 R
- Physiology 4 Physics or Bacteriology 10 5 R
- Math or Exact Science Elect. 5 R
- S.S. 42 Intermediate type 2 R
- P.E. or M.S. 1 R

<table>
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<tr>
<td>English 2, Basic Communications</td>
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<tr>
<td>Physiology 4 Physics or Bacteriology</td>
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<tr>
<td>Math or Exact Science Elect.</td>
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<tr>
<td>S.S. 42 Intermediate type</td>
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#### Spring
- English 3, Basic Communications 3 R
- Math or Exact Science Elect. 3 R
- S.S. 43 Advanced Type 2 R
- Psychology 53 Elementary General Psychology 5 R
- P.E. or M.S. 1 R
- Electives 2 S

<table>
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<tr>
<td>English 3, Basic Communications</td>
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<tr>
<td>Math or Exact Science Elect.</td>
<td>2</td>
</tr>
<tr>
<td>S.S. 43 Advanced Type</td>
<td>1</td>
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</tbody>
</table>

### Sophomore Year

#### Fall
- B.A. 4 Business Law 2 R
- B.E. 85 Consumer Education 3 R
- S.S. 75 or 141 Shorthand I and Diet-Tran. 3-5 S
- B.A. 1 Introductory Accounting 4 R
- Speech 21, Intermediate Public Speaking 3 S
- B.E. 35 Int. & Field Exp. in Bus. Edu. 3 R
- P.E. or M.S. 1 R

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>B.A. 4 Business Law</td>
<td>2</td>
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<tr>
<td>B.E. 85 Consumer Education</td>
<td>3</td>
</tr>
<tr>
<td>S.S. 75 or 141 Shorthand I and Diet-Tran.</td>
<td>3-5 S</td>
</tr>
<tr>
<td>B.A. 1 Introductory Accounting</td>
<td>4</td>
</tr>
<tr>
<td>Speech 21, Intermediate Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>B.E. 35 Int. &amp; Field Exp. in Bus. Edu.</td>
<td>3</td>
</tr>
<tr>
<td>P.E. or M.S.</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Winter
- B.A. 2 Introductory Accounting 4 R
- B.A. 5 Business Law 2 R
- Language or Arts Elective 5 R
- S.S. 76 or 142 Shorthand II and Diet-Tran. 3-5 S
- S.S. 92 Business Machines 2 R
- P.E. or M.S. 1 R

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<th>Course</th>
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<tbody>
<tr>
<td>B.A. 2 Introductory Accounting</td>
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<tr>
<td>B.A. 5 Business Law</td>
<td>2</td>
</tr>
<tr>
<td>Language or Arts Elective</td>
<td>5</td>
</tr>
<tr>
<td>S.S. 76 or 142 Shorthand II and Diet-Tran.</td>
<td>3-5 S</td>
</tr>
<tr>
<td>S.S. 92 Business Machines</td>
<td>2</td>
</tr>
<tr>
<td>P.E. or M.S.</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Spring
- B.A. 6 Business Law 2 R
- S.S. 77 or 143 Shorthand III and Diet-Tran. 3-5 S
- Language or Arts Elective 2 S
- Economics 51 General Economics 5 R
- B.A. 3 Introductory Accounting 4 S
- P.E. or M.S. 1 R

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>B.A. 6 Business Law</td>
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<tr>
<td>S.S. 77 or 143 Shorthand III and Diet-Tran.</td>
<td>3-5 S</td>
</tr>
<tr>
<td>Language or Arts Elective</td>
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</tr>
<tr>
<td>Economics 51 General Economics</td>
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<tr>
<td>B.A. 3 Introductory Accounting</td>
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<td>P.E. or M.S.</td>
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</table>

### Junior Year

#### Fall
- Economics 52 Economic Problems 3 R
- Psychology 100 Human Growth and Development 3 R
- B.E. 170 Methods of Teaching Typewriting and Office Practice 3 R
- S.S. 167 Office Practice 2 R
- Elective or minor 3-4

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Economics 52 Economic Problems</td>
<td>3</td>
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<tr>
<td>Psychology 100 Human Growth and Development</td>
<td>3</td>
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<tr>
<td>B.E. 170 Methods of Teaching Typewriting</td>
<td>3</td>
</tr>
<tr>
<td>S.S. 167 Office Practice</td>
<td>2</td>
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<tr>
<td>Elective or minor</td>
<td>3-4</td>
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</table>

#### Winter
- B.A. 185 Managing Personal Finances 5 R
- Psychology 102 Elementary Psychology for S.T. 3 R
- B.A. 143 Business Communications 3 R
- B.E. 180 Methods of Teach. Shorthand and Transcription 3 R
- S.S. 186 Secretarial Procedures 3 R

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<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>B.A. 185 Managing Personal Finances</td>
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<tr>
<td>Psychology 102 Elementary Psychology for S.T.</td>
<td>3</td>
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<tr>
<td>B.A. 143 Business Communications</td>
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<tr>
<td>B.E. 180 Methods of Teach. Shorthand and Transcription</td>
<td>3</td>
</tr>
<tr>
<td>S.S. 186 Secretarial Procedures</td>
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</tr>
</tbody>
</table>

### Senior Year

#### Fall
- B.E. 189 Principles of Business Education 3 R
- B.A. 140 Insurance or Economics 127 Social Security or Upper B.A. elect. 3 R
- P.H. 135 Public Health 3 R
- B.A. 14 Electric Accounting Machines 3 S
- B.A. 15 IBM Machine Practice 1 S
- B.A. 161 Principles and Problems in Retailing 5 R

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>B.E. 189 Principles of Business Education</td>
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</tr>
<tr>
<td>B.A. 140 Insurance or Economics 127 Social Security or Upper B.A. elect.</td>
<td>3</td>
</tr>
<tr>
<td>P.H. 135 Public Health</td>
<td>3</td>
</tr>
<tr>
<td>B.A. 14 Electric Accounting Machines</td>
<td>3</td>
</tr>
<tr>
<td>B.A. 15 IBM Machine Practice</td>
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<tr>
<td>B.A. 161 Principles and Problems in Retailing</td>
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#### Spring
- B.A. 171 Personnel Administration 5 R
- B.A. 127 Income Tax Accounting 4 S
- S.S. 175 Office Electives 4
- Education 115 Secondary School Curriculum 3 R

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>B.A. 171 Personnel Administration</td>
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<tr>
<td>B.A. 127 Income Tax Accounting</td>
<td>4</td>
</tr>
<tr>
<td>S.S. 175 Office Electives</td>
<td>4</td>
</tr>
<tr>
<td>Education 115 Secondary School Curriculum</td>
<td>3</td>
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</tbody>
</table>

### Additional Notes
- B.E. 178 Methods of Teaching Business—non skilled 3 R
- Education 111 Principles of Secondary Education 3 R
- Sociology, History or P.S. elect. 3-5 S
- Education 114 Org. and Adm. 3 R
- S.S. 187 Secretarial Procedures 3 R
- Elective or minor 2

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>B.E. 178 Methods of Teaching Business—non skilled</td>
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</tr>
<tr>
<td>Education 111 Principles of Secondary Education</td>
<td>3</td>
</tr>
<tr>
<td>Sociology, History or P.S. elect.</td>
<td>3-5 S</td>
</tr>
<tr>
<td>Education 114 Org. and Adm.</td>
<td>3</td>
</tr>
<tr>
<td>S.S. 187 Secretarial Procedures</td>
<td>3</td>
</tr>
<tr>
<td>Elective or minor</td>
<td>2</td>
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</tbody>
</table>

#### Notes
- Winter
- Spring
- Education 127 Secondary School
- Education 129 Student Teaching 5 R
- Education 130 Student Teaching 4 R
- Education 130 Student Teaching 4 R
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 an evaluation of their proficiency. Courses bypassed in this manner should have elective courses substituted for them.

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.

Students may count either B.E. 178, 179, or 180 toward the 33-credit professional requirement if needed. Any one of these courses will substitute for Education 115 for certification requirements.

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

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) Staff

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

179. Methods of Teaching Typewriting and Office Practice. Instructional methods and new developments in teaching of typewriting, Methods for building accuracy, speed, and increasing production; work standards; classroom equipment and materials. Also, includes instructional methods and materials in teaching of office practice and business machines. (1-6Su) Staff

180. Methods of Teaching Shorthand and Transcription. Instructional methods and materials in the teaching of shorthand, transcription, business English, filing and secretarial procedure. Includes factors affecting speed building and standards and grading in shorthand, and transcription. For the inexperienced business teacher education student. (3W) Olsen

189. Principles of Business Education. The study of current problems in Business Education and a survey of the recent literature in the field. (3F) Wiper

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) Wiper

220. Improvement of Instruction in Shorthand and Transcription. Designed for in-service teachers of shorthand and transcription. A study of improved methods and techniques applicable to the teaching of shorthand and related courses in the high school and junior college level. (3Su and as needed) Staff

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) Wiper

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) Wiper

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) Wiper

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) Wiper

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

66 College of Business and Social Sciences
### Business Education and Office Administration

#### 280. Seminar in Business Education. An analysis of research methods applicable to business education. (2Su and as needed) Wiper

#### 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) Wiper

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

### Office Administration

The program of Office Administration is arranged on a four-year degree pattern. Students who initially enroll for only two years may change to a four-year degree program by making up degree requirements.

The following suggested program for the Bachelor of Science degree with a major in Office Administration may be adjusted by advisers so as to more specifically meet individual needs. Transfer students’ programs will be adjusted to provide for transfer of credits.

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>English 1 (Basic Com.)</td>
<td>3 R</td>
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<tr>
<td>Biology 1</td>
<td>5 R</td>
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<tr>
<td>S.S. 75 Shorthand I</td>
<td>3 R</td>
</tr>
<tr>
<td>S.S. 41 Elem. Type or equiv. or B.A. 20 Int. to Bus.</td>
<td>2-3 R</td>
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<tr>
<td>Elective</td>
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<tr>
<td>P.E.</td>
<td>1 R</td>
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<tr>
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<tbody>
<tr>
<td>English 2 (Basic Com.)</td>
<td>3 R</td>
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<tr>
<td>Physiology 4 or Bacteriology 10</td>
<td>5 R</td>
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<tr>
<td>S.S. 76 Shorthand II</td>
<td>3 R</td>
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<tr>
<td>S.S. 42 Intermediate Type</td>
<td>2 R</td>
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<tr>
<td>S.S. 92 Business Machines</td>
<td>2 R</td>
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<tr>
<td>P.E.</td>
<td>1 R</td>
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#### Sophomore Year

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<tr>
<td>Economics 51</td>
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<tr>
<td>Language Arts elective</td>
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<tr>
<td>S.S. 141 Dictation and Transcription I</td>
<td>5 R</td>
</tr>
<tr>
<td>P.E.</td>
<td>1 R</td>
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<tr>
<td>B.A. 30 Business Math</td>
<td>2 R</td>
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<table>
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<td>Economics 52</td>
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<tr>
<td>Language Arts elective</td>
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<tr>
<td>S.S. 142 Dictation and Transcription II</td>
<td>5 R</td>
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<tr>
<td>P.E.</td>
<td>1 R</td>
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<table>
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<tbody>
<tr>
<td>Exact Science elective</td>
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<tr>
<td>English 5 or L.A. elect.</td>
<td>3 S</td>
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<tr>
<td>S.S. 143 Dictation and Transcription III</td>
<td>5 R</td>
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<tr>
<td>S.S. 65 Records Administration</td>
<td>3 R</td>
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<td>1 R</td>
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#### Junior Year

<table>
<thead>
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<tbody>
<tr>
<td>B.A. 1 Accounting</td>
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<tr>
<td>B.A. 4 Business Law</td>
<td>2 R</td>
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<tr>
<td>S.S. 94 Posting and Key Driven Calculators</td>
<td>2 R</td>
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<tr>
<td>B.A. 140 Insurance</td>
<td>3 R</td>
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<td>Electives or Minor</td>
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<tbody>
<tr>
<td>B.A. 2 Accounting</td>
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<tr>
<td>B.A. 5 Business Law</td>
<td>2 R</td>
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<tr>
<td>B.A. 143 Business Communications</td>
<td>3 R</td>
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<tr>
<td>B.A. 185 Managing Personal Finances</td>
<td>5 R</td>
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<tr>
<td>B.A. 151 Marketing Principles</td>
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<tbody>
<tr>
<td>Psychology 53</td>
<td>5 R</td>
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<tr>
<td>B.A. 6 Business Law</td>
<td>2 R</td>
</tr>
<tr>
<td>S.S. 167 Office Practice</td>
<td>2 R</td>
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<tr>
<td>B.A. 3 Introductory Accounting</td>
<td>4 S</td>
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#### Senior Year

<table>
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<tbody>
<tr>
<td>B.A. 161 Principles and Problems in Retailing</td>
<td>5 R</td>
</tr>
<tr>
<td>B.A. 171 Personnel Administration (or 151)</td>
<td>5 R</td>
</tr>
<tr>
<td>S.S. 175 Office Management</td>
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<tbody>
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</table>
Winter

B.A. 14 Electric Accounting Machines .......... 3 R
B.A. 15 IBM Machine Practices ............... 1 R
S.S. 186 Secretarial Procedures ............... 3 R
B.A. Elective ........................................ 3 R
Electives or Minor ..................................... 6

87 IBM Key Punch Speedbuilding ............... 1 R
Economics 127 Social Security or
B.A. elect. ........................................... 3 R
S.S. 187 Secretarial Procedures ............... 3 R
Electives or Minor ..................................... 8

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Spring

S.S. 87 IBM Key Punch Speedbuilding ......... 1 R
Economics 127 Social Security or
B.A. elect. ........................................... 3 R
S.S. 187 Secretarial Procedures ............... 3 R

Electives or Minor ..................................... 6

16

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 an evaluation of their proficiency. 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 with departmental approval.

Office Administration 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. Emphasis on skill building, typing of letters, envelopes, manuscripts, business forms and tabulation exercises. Prerequisite: S.S. 41 or equivalent.
(2F, W, S)
Lundstrom

43. Advanced Typewriting. The development of number proficiency, statistical tabulation and typing on business forms, rough drafts, stencils for duplication. Prerequisite: S.S. 42.
(2W, S)
Lundstrom

45. Skill-Building Typewriting. Remedial typing, with emphasis on improvement of accuracy and speed. (1F, W, S)
Wiper

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 office administration students.
(2S)
Peterson

(3F, W, S)
Lundstrom

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

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

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

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

92. Business Machines. Basic training in the use of ten-key adding-listing machines, printing calculators, 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.
(2F, W, S)
Olsen Peterson

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 equivalent, and S.S.
(3F, W, S)
Olsen Peterson

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

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, Economics 51, 52. (3F)

**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 services, financial records, writing for publication, minutes and meetings. (3W, 3S)

**Olsen**

**Combination Major**

**Combination Major in Office Administration and Family Life.** This curriculum is designed for women who desire sufficient secretarial training to provide professional opportunities outside the home as well as a basic training for family living.

The Secretarial type program may be combined with the Family Life program. The four-year degree program on the previous page may be adjusted to emphasize a 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**

Forty-two hours with not fewer than nine in any department:

- **Household Economics and Management**
  - HEM 65 Housing ........................................... 3
  - HEM 75 Home Furnishings ............................... 3
  - HEM 100 Household Equipment .......................... 3
  - HEM 149 Home Management ................................ 3
  - HEM 150 Home Management House ......................... 4
  - HEM 155 Family Finances .................................. 3

- **Clothing and Textiles**
  - CT 8 Basic Clothing Construction ....................... 3
  - CT 24 Textiles ............................................ 3
  - CT 25 Intermediate Clothing Construction ............. 3
  - CT 105 History of Costume ................................ 3
  - CT 125 Draping ............................................ 3
  - CT 165 Tailoring ........................................... 3
  - CT 170 Flat Pattern Designing ........................... 3
  - CT 185 Family Clothing .................................... 3

- **Foods and Nutrition**
  - FN 24 Principles of Nutrition ........................... 3
  - FN 24a Principles of Food Preparation ................ 3
  - FN 25 Meal Preparation for the Family .................. 3
  - FN 107 Experimental Foods ................................ 3
  - FN 135 Weight Control .................................... 2
  - FN 140 Nutrition ......................................... 5
  - FN 141 Child Nutrition .................................... 2
  - FN 146 Food Technology .................................... 2

- **Family and Child Development**
  - FCD 20 Preparation for Marriage and Family Relations 3
  - FCD 120 Marriage ........................................... 3
  - FCD 67 Early Childhood .................................... 3
  - FCD 68 Preschool Laboratory ................................ 2
  - FCD 77 Child from 6-12 .................................... 3
  - FCD 100 Human Growth and Development .................. 3
  - FCD 108 Guidance of the Young Child .................... 3
  - FCD 115 Growth of the Infant ............................. 3
  - FCD 120 Play and Play Materials .......................... 3
  - FCD 185 Family in Middle and Later Years ............... 3

A two-year secretarial course is also offered to prepare students for a secretarial or clerical position in the shortest period of time.
The Department of Economics offers the Bachelor of Science and Master of Science degrees. To complete a major one should register with the head of the department after achieving junior standing. A prospective major 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 specific interests of the 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. (3F, 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. (3F, W, S) Staff

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


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) Murray

126. Trade-Unionism and the Law. The legal framework of the trade union activity; restrictive, permissive, and promotional legislation; the judiciary and labor. (3W) Murray

127. Social Security. Survey of the main divisions of social security legislation; workers' compensation, legal minimum wage, regulation of hours, unemployment compensation, old age insurance, family wage systems and health insurance. (3S) Murray

128. 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

129. 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

130. 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. Communist Economics. History and economic theories of Marxism, the organization of Communist economics, and the economic policies and problems of Russia, China, and other Communist countries. (3W) 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

157. 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, S) Collier

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 Development. Theories and principles of economic development, characteristics and problems of underdeveloped and developing countries, alternative techniques and policies for the promotion of growth and development. (3S) 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) Dutschke

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


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

212. Seminar in Industrial Relations. Application of principles and practices of American trade-unionism brought to light through individual and group research projects; analysis and evaluation of current issues in labor activities. (2W) Murray
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, S. George Ellsworth, M. Judd Harmon, Brigham D. Madsen, Edwin L. Peterson; Assistant Professor Phillip Spoerry; Instructors Stanford Cazier, Jay A. Emenhiser.

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

History

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

Major in History. For a major in History the student must complete forty hours in History. The minor (a minimum of eighteen hours) should be in a closely related field. The student should complete as soon as possible survey courses in the History of World Civilization, History 13, and 14. History 190 is recommended for the Junior year and History 201 for the Senior year. Those who plan to obtain a teaching certificate should register early with the College of Education to assure the right courses for certification. Those who plan to do graduate work in History are encouraged to 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. Those who plan to teach should either (1) pursue work leading to the major in History and the secondary certificate. The former plan is regarded as preferable. The History faculty advises History majors; teaching majors may be advised by either the History faculty or the Education faculty.

Teaching Major in History. For a teaching major in History, the student must complete a minimum of 36 hours in History, and a minimum of twenty hours in a minor. History 4, 5, 13, and 14 are preferred courses for this program. History 190 should be taken before practice teaching. A teaching major in History should include a broad foundation in the Social Sciences and therefore the minor should be in one of the Social Sciences. All upper division courses in History and work in the minor and allied fields should be selected in consultation with one's adviser.

Minor in History. A minor in History consists of 18 or more hours. History 13 and 14, and History 1, 2, and 3, or History 4 and 5 are recommended. A member of the History faculty will be pleased to advise concerning the minor.

Institute of Utah Studies

By virtue of its Library holdings, its faculty, and its research pro-
grams, 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, 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. Students with this interest should give special attention to History 135, 137, 226, and 237.

Graduate Study

Master of Science in History. The program of studies for the Master of Science degree in History is described in the catalog of the School of Graduate Studies. Those who are interested in this program should 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 2. From about 1850 to the present day. 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, Madsen

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

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

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
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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) Spoerry

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, Madsen

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. (5W) Cazier

176. History of the Far East. Emphasis on China, Japan, and Russia since 1900. (3W) Spoerry

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

144. Civil War and Reconstruction. (8S) Cazier

152. The American Revolution. The background, philosophy, nature, campaigns, and consequences of the American revolution. (3F) Madsen

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) Madsen

171. Constitutional History of the United States. (6F) Madsen

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

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) Madsen

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

Students who major in Political Science should have at least 35 hours in the field. Exceptions are made in certain cases and particularly for those who plan to enter law school. All major students should complete successfully Political Science 10, American Government. Students must have grades of "C" or above in all courses counted toward the major. Before being certified for graduation by the department the student must pass a comprehensive examination in the field. Students will be notified of the time and place of examinations.

All students who wish to graduate in Political Science should have
a member of the department as an adviser.

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. Students interested in the program should obtain a copy of the Graduate Catalog and must also consult with a member of the Political Science faculty.

Political Science Courses

1. Government and the Individual. 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) Emenhiser, 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

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) Emenhiser, 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) Anderson

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

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) Emenhiser

117, 118, 119. American Political Thought. A survey of American political ideas and the men who developed them. The historical approach is used, beginning in colonial times and carrying the development of American political thought through to the present. 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) Emenhiser

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. Students should have had at least one course in international relations or foreign policy. (3S) Anderson

131. Administrative Law. Constitutional limitations, legislative supervision, and judicial control of administrative agencies, and the forms of administrative action appropriate for American economic and political institutions. (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 legislatures. 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) Anderson

150. World Political Geography. (4) Staff

151. Introduction to Public Administration. Defines the subject matter of public administration, concentrates upon analyzing the problems of governmental administrative organization and management, and explores the methods of securing responsible performance from the bureaucracy. (3F) Emenhiser

152. Public Personnel Administration. Reviews the trends and techniques of recruiting and developing the public service and calls attention to the machinery established for these purposes. Prerequisite: Political Science 151. (2W) Emenhiser
153. Public Finance Administration. Describes national, state, and local governmental budgetary and accountability processes in relation to policy formulation. Prerequisite: Political Science 151. (2S) Emenhiser

154. Public Administration Internship. Offers the student the opportunity to observe and, within limits, practice what he has learned from his class-room experience. The student will be placed in a nearby governmental office where he will be expected to spend the equivalent of one day per week performing administrative tasks or conducting an administrative survey. Prerequisite: Political Science 151, 152, and 153. (2F, 2W, 2S) Emenhiser

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


171. Major Governments of Asia. Principal attention will be given to the governments of Japan, China, and India, but other Asian governments will be considered. (3W) Spoerry

172. Major Governments of Latin America. A comparative study of the governments of Argentina, Brazil, Mexico and other selected Latin American countries. (3S) Porter

173. Soviet Government and Politics. Designed to present the structure and functioning of the Soviet government and Communist party. Attention is given to the theoretical background of Communist government and party practices in modern times. (3F) Spoerry

180, 181, 182. Current Political Problems. Any quarter may be taken without the preceding quarter or quarters. Lower division students must receive consent of the instructor. (2F, 2W, 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.

Those who plan to enter law school should take the Law School Aptitude test several months prior to the time entrance is desired. Many law schools now require that test scores be included in the applications. Applications for the test should be made to 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. Law students should be skilled typists and familiar with accounting procedures.

Sociology and Social Work 77

Social Science Courses

1. General Social Science. A basic general education course giving synthesis of the social science disciplines. (S.F., 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. Students may register for one, two or three quarters. Fall quarter, 5 and 6; winter quarter, 6 and 7; spring quarter, 5 and 7. (S.F., 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. (S.F., 3W, 3S) Peterson

Department of Sociology and Social Work

Professor R. Welling Roskelley, Head; Associate Professors Therel R. Black, William A. DeHart, Carmen D. Fredrickson, Evelyn H. Lewis; Assistant Professor John A. Pennock.

Office in Main 212

Sociology

A major in Sociology 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 the adviser at the time of registration.

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

Students are required to complete at least four hours of Seminar 190 for graduation.

In addition to the minimum 47 hours mentioned above students are required during each quarter in residence to participate in a number of projects sponsored by the staff. These projects are designed to provide laboratory experiences in which students may obtain practical experience diagnosing social situations and developing programs to resolve problems.
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 for the PhD degree are explained in the Graduate School section. Also see catalog, School of Graduate Studies.

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


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. Woman 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
**Sociology and Social Work 79**

   **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 associate living. (5)  
   **Black**

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

   **Pennock**

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

174. Criminology. Extent and nature of crime, and various factors related to criminal behavior. Theories of crime causation. Methods of law enforcement. (3)  
   **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. (3)  
   **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: Sociology 287. Credit arranged. (F, W, S)  
   **Staff**

   **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)  
   **Roskelly**

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

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)  
   **Roskelly**

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

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**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 100 under-
graduate 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. Major professors will aid in their selection. S.W. 173 is a suggested prerequisite to other social work courses.

In addition to the minimum 49 hours listed above, students are required, during each quarter in residence, to participate in a number of projects sponsored by the staff. These projects are designed to provide laboratory experiences in which the students may obtain practical experience diagnosing social situations and developing programs to resolve problems.

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. (9W) Lewis

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

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) Lewis

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 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


195. Social Work Seminar I. Social Work publications and other source material applicable to the field. (1W) 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) Roskelley
College of Education

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  Teacher Education, 86
  Graduate Study, 89

Department of Health, Physical Education and Recreation, 94

Library Science, 102

Department of Psychology, 103

Degrees Offered:
  Bachelor of Science
  Master of Education
  Master of Science
  Doctor of Education
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; 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 Departments of Psychology and Health, Physical Education and Recreation also prepare individuals for professional careers other than in education.

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 1962-63.

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 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 pre-
paring to teach Kindergarten and grades one through six. Here child 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 elementary 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 concerning graduate work is found in the Graduate School section of this catalog. A separate catalog is also issued by the School of Graduate Studies.

Teacher Placement Service. The University is interested in placing its graduates in professional positions. To accomplish this purpose in the College of Education, the Teacher Placement Service has been organized. If students qualify for teaching or other professional certificate they 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.
A student preparing to teach vocational agriculture 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 students in selecting courses throughout four years of College work.

Graduate Study

Opportunity is offered for research and graduate study in Agricultural Education. In graduate work, select a coordinated program of study in the Colleges of Agriculture and Education.

Prescribed Courses for Majors in Agricultural Education

<table>
<thead>
<tr>
<th>Biological Science:</th>
<th>Cr. Total</th>
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<tbody>
<tr>
<td>Botany 24</td>
<td>5</td>
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<tr>
<td>Zoology 3</td>
<td>5</td>
</tr>
<tr>
<td>Zoology 112 (Genetics)</td>
<td>5</td>
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<tr>
<td>Bacteriology 10 or 70, and 71</td>
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<tr>
<th>Language and Arts:</th>
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<tbody>
<tr>
<td>Environmental Planning¹</td>
<td>3</td>
</tr>
<tr>
<td>Speech, or Music, or Art or Literature¹</td>
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<td>Basic Communications 1, 2, 3</td>
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<th>Social Sciences:</th>
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<td>Psychology 53, Sociology 10 or 70¹ or Political Science 10¹ or History 14¹</td>
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<td>Mathematics 34¹</td>
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<td>Physics 6 or 7, Geology 3 or Math 35</td>
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Total 69

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

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<tr>
<th>Animal Industry:</th>
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<td>Elective</td>
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<table>
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Total 84

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<th>Education:</th>
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<td>Psychology 100, 102</td>
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<tr>
<td>Public Health 155 (or 154—3 cr.)</td>
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Total 69

Total Minimum Requirements For BS Degree

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<tr>
<td>Education</td>
<td>35</td>
</tr>
<tr>
<td>Military Science or P.E.</td>
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</tbody>
</table>

Total 194

¹Courses which meet lower division group requirements.
Ag Education Courses


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. Students observe and teach under supervision in approved local vocational agriculture departments. Students 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) 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


Office in Education 203

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

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 in-
formation and guidance before making his decision. Those wanting the course should take it during the freshman or sophomore year.

Students are not permitted to enroll in professional courses in education unless they have been admitted to the Teacher Education program, nor will a student be admitted to student teaching in either secondary or elementary education unless his total grade point is 2.0 or above, and the grade point average in the teaching major and minor and professional certification subjects, 2.5 or above. The student should be financially prepared to spend a quarter off campus student-teaching.

**The 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, students 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. **Areas of academic concentration.** Thirty-six credit hours in one field of concentration or eighteen hours in each of two fields.

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 108, 181, 182, 183, 123, 145, Speech 167, Child Development 67, 68.

   - **GROUP II Understanding the School**
     - Education 103 .................. 4
     - Education 114 .................. 3

   - **GROUP III Curriculum and Methods and Student Teaching**
     - Education 104 ............... 5
     - Education 105 ............... 3
     - Education 106 .............. 12
     - Education 107 ............... 3
     - Psychology 108 ............. 3

   - **Elective Courses (Minimum of six hours)**
     - Education 102 ............... 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 the major field of concentration or two minors
     - Electives in education and related areas.

   - **Fourth Year**
     - Psychology 108
     - Education 104
Education 105
Education 106
Courses to complete the major field of concentration or two minors.
Elective courses in education and related areas.

Kindergarten Certification. Having completed the requirements for the elementary school certificate, a student 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, the student 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, the Department of Education, and the Council on Teacher Education.

Students completing a teaching major and minor may graduate in either the department offering that major or the Department of Education. Individuals completing a composite major usually graduate from the Department of Education. Regardless of the department in which the student majors, he must apply and be granted permission to enter the teacher education program by the admissions committee of the Department of Education. It is advisable for the student to make this application as early as possible in his college program because he 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 students 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 of 15 credits)
Education 127 3
Education 129 5
Education 130 4
Special Methods

Students are required to take the special methods course in a teaching major if it is offered. If it isn't offered, Education 115 is required. The special methods course in the minor field is also recommended.

**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

Additional courses may be elected 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, candidates must (1) complete the requirements for a composite teaching major or for a teaching major and minor as indicated above; and (2) complete 15 credits required for certification in secondary education, including Psychology 102, Education 127 or 138, and 130.

**Homemaking, Industrial Arts, Business Education, Agriculture.** Students desiring to major in Homemaking Education, Industrial Arts Education, or Agricultural Education should consult the professional education requirements listed under these departments.

Graduate Study

See statement of the Graduate School in this catalog.

The College of Education provides programs leading to the graduate degrees of Doctor of Education, Master of Science, and Master of Education. The graduate programs are designed for teachers, supervisors and administrators who demonstrate by aptitude and experience the capacity to benefit from graduate study. Special courses are set up for teachers who wish to improve their competence and deepen their understanding of the subject they teach. Specialized training in various fields is offered to those who wish to prepare for administrative and supervisory positions.

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, and in the handbook issued by the Graduate School.

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) Williams

102. **Teaching the Language Arts.** A study of language development in children and its implication for classroom practice: listening, speaking, writing and reading. (SS, Su) Shaw

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, Su) Allred

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, Su) Wiggins, Pugmire


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

Allred 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 156 must be taken or audited concurrently. (5F, W, S) Shaw, Pugmire, Wiggins

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, Su) Shaw, Wiggins

108. Social Studies in the Elementary School. Organizing the elementary curriculum to provide social studies experiences consistent with the nature of the child and the democratic society in which he lives. (3W, Su) 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, Su) 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. (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 types curricula and methods. (3F, W, S, Su) 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, Su) Himes

114. Organization and Administration. Fundamental principles of operating public schools with emphasis on Utah conditions. (3F, W, S, Su) Hansen, Noble

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) Hatch, Staff

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, Su) 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, Su) 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, Su) 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 Schools. These courses must be taken concurrently with Education 127, constituting a block of twelve credits. Fifteen quarter hours of credit is considered the maximum load while doing student teaching. Student teachers should plan to spend a half-day at the school to which they are assigned. The application for student teaching must be approved the preceding quarter. Prerequisites: Education 111 and Psychology 100 and 102. Any deviation from the above program must be approved by the Director of Student Teaching. 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.

(5-4F, W, S)

Budge, Drake, Braswell, Hammond, Noble, Rasmussen.

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. (3Su)

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. (8F)

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. (8W, 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)

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 197 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. (3F, S, 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. (3Su)

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

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, W, Su)

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

162. Audio-Visual Techniques. An advanced course designed to prepare students in the operation, care and maintenance of Audio-
92 College of Education

Visual equipment. The construction and proper utilization of teaching aids in the classroom will also be emphasized. (3Su) Staff

Hansen, Noble

Other Methods Courses in Secondary Education:

Teaching of Art. (See Visual Arts 152) Staff

Teaching of Business Subjects. (See Business Education 178, 179, 180) Staff

Teaching of Journalism. (See Journalism 191) Staff

Teaching of Languages. (See French 113, German 112, Spanish 112.) Staff

Teaching of Math. (See Math 175) Staff

Teaching of Music. (See Music 151, 152, 153) Staff

Teaching of Physical Education. (See Physical Education 120) Staff

Teaching of Speech. (See Speech 123) Staff


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) Allred, Shaw

205. Reading and Conference. Provides for individually directed study in subjects of special interest and preparation. (1-2F, W, S, Su) Staff

207. Elementary School Administration. Operation and management of the elementary school. (3F, Su) Allred

208. School Supervision. Principles and practices of school supervision, including qualifications and responsibilities of supervisors of instruction. (3W, Su) Allred, Shaw


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. (3S, Su) Drake

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) Staff

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. (3S, 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

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) Carlisle

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) Staff

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) Staff

267. Introduction to Research. Deals with identifying a problem for the thesis or seminar report, reviewing and evaluating research lit-
erature, 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 EdD candidate and for the M.S. candidate who desires advanced training in research. Prerequisite: Education 267. (SS) Borg


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) Staff

298. Field Experiences in School Administration. Provides introductory experiences in school administration. Students work a minimum of five hours weekly under the direction of an administrator in the public schools, either elementary or secondary. The University supervisor will direct programs and meet in seminars periodically. Credit arranged. (F, W, S) Hatch, Alfred

299. Internship in School Administration. Provides extensive experience for the advanced student working on the Doctor of Education Degree in School Administration. Students work a minimum of one quarter full time under the direction of an administrator in the public schools. Credit arranged. (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


322. Administration of School Personnel. Principles and practices in management of teachers, other school employees, and students. (3S, S) Staff

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) Staff

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) Staff
Department of

Health, Physical Education
and Recreation


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 recreational interests of the total student body. Through intramural sports, student clubs, recreation periods, and special events, a variety of recreational opportunities are offered.
The purpose of these activities is to develop a love for wholesome recreation, and sufficient skill to allow individuals to participate with satisfaction and enjoyment in various activities. Clubs are organized in hiking, water sports, winter sports, dancing, archery and badminton. The physical education facilities are available to students at certain times of the day, and the intramural sports program is open to the whole student-body.

*Professional preparation in physical education.* A student may major in Physical Education with specialization in Elementary Physical Education, Secondary Physical Education, Professional Scouting or Pre-Physical Therapy. Selection of a program of study in these areas should be carefully planned under the guidance of advisors. The following courses, in addition to the six credits required for graduation, are suggested for each of the above areas:

As a Non-certiﬁng Physical Education major complete Physical Education 17A, 18, 20, 21, 22, 30, 31, 75, 78, 81, 82, 85, or 92, 106, 107, 108, 183; six credits in Sports Techniques and ten credits from approved electives.

If specializing 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.

If specializing in Dance a student should complete Physical Education 21, 24, 26, 77, 78, 79, 83, 102, 103, 104, 106, 107, 111, 120, 121, 140, 150, 151, 153, and 14 credits selected from the following courses in Theater Arts: 50, 52, 55, 57, 59, 152 and 154. P.E. 165, 183, 192.

For a composite major in Dance and Physical Education a student should complete Physical Education 20, 24, 26, 74, 75, 77, 78, 79, 81 or 111, 83, 92, 102, 104, 106, 107, 108, 120, 121, 122, 140, 150, 151, 160, 161 or 162, 165, 183, 184, and 192.

If planning to enter a Physical Therapy School with a major in Physical Education a student should complete Physical Education 17A, 18, 55, 74, 75, 83, 106, 107, 108, 183; four credits in Sports Fundamentals, Sports Techniques, and 12 hours of approved electives. Physical Therapy students work closely with their advisors in selecting courses to fill groups and minor requirements.

For Secondary Physical Education majors the following four year programs are suggested.

**MEN**

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**SOPHOMORE**

| Course   | P.E. 30, 31, 32 | P.E. 74 | P.E. 83 | P.E. 84 | P.E. 85 | Education 50 | Any Quarter |
|          | 1       | 3       | 3       | 3       | 3       | Any Quarter | All Quarters |
| Minor    | 3       | 3       | 3       | 3       | 3       | Any Quarter | All Quarters |
| Electives (include Physiology 20—) | 3       | 3       | 3       | 3       | 3       | 3       | 3       |

1Recommended Group Requirement. Ex. Sc.: Chem. 10 and Physics 3 or 6; Biol. Sc.: Zoology 1 and Physiology 4.
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Professional Preparation in Health Education

The following foundation science courses are recommended for a Teaching Major or Minor in Health Education: Biology 1, Physiology 4, Psychology 53, Sociology 70, Chemistry, and Physics.

Health Education Major: For completion of a Bachelor of Science degree with a Teaching Major in Health Education, a student shall complete a minimum of 45 hours of approved courses selected from the following groups: (A) Required Courses: Bacteriology 10, P.H. 15, P.H. 150, H.E. 55, H.E. 135, H.E. 145, Foods 5, F&CD 20, and Psy. 145 or S.W. 162. (B) Recommended Courses (A minimum of 10 hours must be selected from this group): Zoology 102, P.E. 84, P.E. 106, P.H. 50, Psychology 140, and Psychology 202. (C) The following courses will also count toward completion of a Health Education major: P.H. 152, F&CD 120 or F&CD 125, Psy. 123, and Phys. 20.

Health Education Minor: For a minor in Health Education a student must complete 20 hours of approved courses including the following: P.H. 15, P.H. 150, H.E. 55, H.E. 145, Foods 5, and Psy. 145 or S.W. 165.

Professional Preparation in Recreation Education

A student may earn a Bachelor of Science degree with a major in Recreation Education. The major
course requirements for such a degree are as follows: P.E. 74, R.E. 83, P.E. 85, P.E. 106, P.E. 153, R.E. 157, R.E. 179, P.E. 183, R.E. 196, Theater Arts 158, Speech 118, Ind. Arts 180, Landscape Arch. 130, Pol. Science 15; plus 4 credits from the following: P.E. 177 or 182, P.E. 175, P.E. Sports Fund. Courses, P.E. Tech. Technique Courses, Forestry 137, 138 or 139, Soc. 141, C.D. 100 or P.E. 84, Bus. Admin. 100.

For a minor in Recreation Education a student must complete: R.E. 83, R.E. 179, P.E. 183, R.E. 196 and seven additional credits selected from those prescribed for a major in recreation.

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, a student must complete the equivalent of a Bachelor's Degree in physical education at USU and additional requirements as prescribed by the School of Graduate Studies. Required courses are: P.E. 250 or 294, 271, 295, 299, Education 267, English 211, Psychology 112.

If entering the department for graduate study, a student should select supporting fields from two other areas of the University, closely allied to Physical Education and Recreation.

Graduate courses should be elected from such areas as Education, Public Health, Sociology, Psychology, Biological Science or others acceptable to the graduate committee.

Physical Education 97

Health, Physical Education and Recreation Activity Courses

Activity Courses for Men

2. Freshman Football (IF) Staff
4. Boxing (Beginning) (1F, 1W, 1S) G. Nelson
5. Boxing (Advanced) (1F, 1W, 1S) G. Nelson
6. Football (Non-Varsity) (1W) Ralston
7. Wrestling (Beginning) (1F, 1W, 1S) G. Nelson
8. Wrestling (Advanced) (1F, 1W, 1S) Staff
10. Indoor Track and Field (1W) Maughan
11. Baseball (IS) Williams
12. Track (IS) Maughan
15. Softball (IS) Staff
16. Swimming (Beginning) (1F, 1W, 1S) Staff
17. Swimming (Intermediate) (1F, 1W, 1S) Staff
23. Basketball (1F, 1W, 1S) Baker
27. Weight Training (1F, 1W, 1S) Staff
29. Varsity Football (1F) Ralston
34. Soccer (1F) Staff
35. Volleyball (1W) Staff
36. Self Defense (1W) Staff
37. Trampoline (1F, 1S) Staff
38. Tumbling and Gymnastics (1W) Staff
64. Cross Country (1F) Maughan

Activity Courses for Women

39. Soccer-Speedball (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 (Beginning) (1F, 1W, 1S) Staff
56. Swimming (Intermediate) (1F, 1W or 1S) Staff
60. Body Conditioning (1F, 1W, 1S) Staff
152. Synchronized Swimming (1F) Staff

Activity Courses for Men and Women

3. Skiing (Beginning) (1W) Staff
9. Fencing (1F, 1W, 1S) Downs
13. Bowling (1F, 1W, 1S) Staff
18. Swimming (Advanced) (1F, 1W, 1S) Staff
98 College of Education

19. Skiing (Intermediate) (1W) Staff
28. Diving, Prerequisite: PE MW 18. (1S)

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)

48. Modern Dance (Beginning) (1F, 1W) Fuller
49. Modern Dance (Intermediate) (1W, 1S) Fuller
50. Modern Dance (Advanced) (1W, 1S) Fuller

53. Square Dancing (1F, 1W, 1S) Jensen
54. Archery (Beginning) (1F, 1W, 1S) Staff
55. Archery (Advanced) (1W, 1S) Staff

61. Badminton (Beginning) (1F, 1W, 1S) Fuller
62. Folk Dance (Beginning) (1F, 1W) Fuller
63. Badminton (Advanced) (1F, 1W, 1S) Downs

70. Tap Dancing (Beginning) (1F, 1W, 1S) Fuller
71. Tap Dancing (Intermediate) (1F, 1W) Fuller
72. Social Dancing (Beginning) (1F, 1W, 1S) Staff
73. Golf (Beginning) (1F, 1S) Staff
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
80. Golf (Advanced) (1S) Staff
82. Tennis (2nd quarter) (1S) Staff
89. Tennis (Intermediate) (1S) Staff

Professional Courses in Physical Education

17A. Swimming. For freshmen and transfer students majoring in Physical Education. (1F, 1W) Rasmussen

20. Fundamentals of Sports. Designed to develop the fundamental skills of tennis and archery. (1F) 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. (1W) 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

29. Fundamentals of Sports. Designed to develop the fundamental skills of boxing, weight training and wrestling. (1W) 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

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) Staff

78. Dance Laboratory. Techniques of intermediate modern dance for freshman and sophomore women majoring or minoring in Physical Education. (1W) Staff

79. Dance Laboratory. Techniques of advanced modern dance for freshman and sophomore women majoring or minoring in Physical Education. (1S) Staff

81. Rhythms and Dramatic Games. Rhythms for young children; its use in creative movement. Methods of presenting and developing rhythms are studied. (2F) Fuller

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


86. Sports Officiating for Men. Knowledge of the rules and mechanics of officiating football, touch football, basketball, wrestling and

Taught 1962-63.

Taught 1963-64.
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


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) Staff

103. Dance Composition. Composition based upon the following musical forms: AB, rondo, theme and variation, canon and round, dance suite. (2S) Staff

104. Dance Production. Composition done independently. Participation in a performance required. Lighting, staging, costume and make-up applied to a dance concert. (2W) Staff

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

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. Classwork 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 teaching techniques in tennis and badminton. Open to men and women. (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

*Taught 1962-63.
**Taught 1963-64.
small water crafts. American Red Cross certification is given students who pass the exam. (2W, 2S) Rasmussen

140. Dance History. A history of dance from the primitive through Greek, medieval and renaissance periods into the theatrical dance forms: ballet and modern. (3W) Fuller

150. Methods in Dance. The place of various types of dance in the physical education program. Emphasis given methods of teaching these activities and practice in teaching class members. (2S) Fuller

151. Techniques of Dance. Techniques of a variety of dance types, with emphasis on ballet and modern. (2S)

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

**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 officiating basketball and pep club activities. (2W) Staff

**162. Techniques in Physical Education for Women. Designed to develop teaching techniques in soccer, speedball and field hockey. (2S) Staff

*165. Techniques in Physical Education for Women. Designed to develop teaching techniques in stunts and tumbling. (2S) Staff

177. Physical Education in the Elementary School. Designed to give a philosophy of Physical Education in the elementary school. Emphasis is on program planning, teaching techniques, the direction and participation in elementary Physical Education activities and the selection of activities that will help satisfy the needs of the elementary school child. (3F, 3W, 3S)

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)

183. Interpretation of Physical Education Objectives. Results and values of Physical Education activities in terms of development, adjustment and standards. (3F)

184. Administration of Physical Education. Administration procedures in Physical Education in the high school; curriculum and program planning. (3S) Hunsaker-McClellan

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

192. Tests and Measurements in Physical Education. Practical studies of tests and technique of test construction. (3W) Hunsaker-McClellan

194. Problems of Athletics. Discussion problems in athletics relative to public relations, athletic management, administration of athletics, purchases of equipment, schedules, plant layout, etc. (3S) Gardner

Professional Courses in Recreation Education

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

123. Cub Leaders Training Course. A course designed to prepare well qualified leaders in cub scouting, and to prepare professional scout leaders in this phase of scouting. (2Su) 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

157. Field Work in Recreation. Practical experience in conducting social recreational activities, such as for church, school and civic groups. Prerequisite: P.E. 83. Credit arranged. (F, W, or S) Jensen

*Taught 1962-63.

**Taught 1983-84.
H. E. 154. First Aid Instructors Course. Prerequisite, American Red Cross Advanced First Aid Certificate. Attention is given to methods of teaching First Aid. Detailed demonstration and practice is given. American Red Cross First Aid Certificate is given to students who pass the examination. (2S) Staff

H. E. 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

Graduate Courses in Physical Education

250. Reading and Conference. Provides for individually directed study. Credit arranged. Hunsaker

271. Research and Thesis Writing. Credit arranged. Hunsaker

275. Philosophy of Physical Education. A study of the divergent origins, conditions, leaders, and forces giving rise to current basic beliefs about Health, Physical Education and Recreation. Development of individual professional philosophies. (3) Hunsaker

294. Research & Evaluation in Physical Education. Methods, techniques, purposes and interpretation of various kinds of research. Practical application in the conduct of a research project is utilized during the class. (3F, 3S) Hunsaker

295. Problems in Physical Education. Various selected problems in Physical Education are studied through the use of literature and discussion as they apply to the individual and the group. Individual problems are emphasized. (3F, 3W, 3S) Hunsaker

297. Analysis of Athletic Performance. A mechanical analysis of all types of athletic performance based upon principles of movement and body mechanics. Advanced methods of developing and using the human body are emphasized. The course includes slow motion photography and actual performance for employing the analysis. (3) Nelson, D.

299. Physical Education Seminar. The group is offered the opportunity of investigating selected bodies of knowledge in Physical Education and discussion materials grow from the depth of investigation. Credit arranged. (F, W, S) Nelson, D.

Professional Courses in Health Education

H. E. 55 Safety and First Aid Instruction. Standard and Advanced American National Red Cross courses in first aid, with emphasis on practical use of the knowledge in various occupations. Detailed demonstrations and practice. American Red Cross First Aid certificates may be obtained by students who pass a satisfactory examination. (3F, 3W) Mendini

H. E. 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

H. E. 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

H. E. 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

H. E. 147. 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

H. E. 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

H. E. 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
Library Science

ASSOCIATE PROFESSOR Milton C. Abrams, UNIVERSITY LIBRARIAN; ASSISTANT PROFESSOR Ida-Marie Logan; 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.


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. (3S) 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. (3S) 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


160. History of Books and Libraries. The history of bookmaking, printing, and libraries. (3F) Staff

170. Readings and Conference. Limited to Library Science minors. Prerequisite: Instructor's consent. Credit arranged. Staff
Department of Psychology
(Psychology and Guidance)

Professors Arden N. Frandsen, Head, Ellvert H. Himes, Heber C. Sharp, David R. Stone; Associate Professors David Glenn White, E. Wayne Wright; Assistant Professors Philip Langer, Ronald Peterson, James T. Tschudy.

Office in Education 301

Psychology—as a bridge between the biological and social sciences—is a scientific approach to understanding the behavior of 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 professional training and personal development.

A major, and preferably a Master's degree, in psychology should prepare students 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 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 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 recommended that the following courses be included: Physiology 4; Sociology 70; English literature (novel and biography) courses; Physics 6, 17, 19 or 31; Mathematics 34, 35, and additional mathematics courses if interested 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, 215, 123, 155, 171, 175, 183, 202, 205. As upper division electives: Sociology 130, 153 or 170; Education 110; Speech 167; Zoology 102; Physiology 104 or 121, 122 and 261; the Education courses for teacher certification; S.W. 165; and upper division courses in literature. Undergraduate students 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, 127, 140 or 145, 170, 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 consultation with the student’s major professor and an advisory committee. A well balanced program to meet professional objectives may be arranged to include courses from Psychology and other pertinent fields. Psychology and guidance courses prepare students 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, (4) child, adolescence, and 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, 217, 221, 224, 225, 235, 238, 262, 270, 276, 280, 282, 283, 285, 286, 287, 288, 289, and 291. If a student has 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. A teaching certificate and a total of 30 credits in Education or/and in Psychology, makes one eligible to begin study for this degree. Included in the required courses are: Education 110; Guidance 287, 213; and Psychology 123
or 140, 181, 183, 200, 202 or 205, 212, 213, 280, 282, 283, 285, 287, 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 Psychology I, Sensation and Perception. A study of the scientific methods and of experimental procedures applied in the study of fundamental problems in psychology, with special analysis in sensation and perception. Prerequisites: Psychology 53 and 112. (3W, S) Staff

80. Reading and Study Skills. A practical course, highly individualized, designed to aid in improving the efficiency of work and study habits. Individual appointments arranged. (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 of junior and senior high school students. 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) Frandsen

116. Research in Psychology. The course gives any able and interested 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) Tschudy

127. Psychology of Learning. A comprehensive study of descriptions and explanations of learning. (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. (5S) 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)

155. Psychology of Business and Industry. The methods and principles of psychology are applied to several general problems in business and industry, including advertising and selling, selection and placement of employees, motivation and morale, training, conditions of work, and productivity. Prerequisite: Psychology 53. (3W)

161. Social Psychology. A study of behavior in the framework of social influences, including communication, social interaction, social norms, roles, leadership, influence of culture and social structure on personality, social attitudes, attitude change, and propaganda. (3W)

171. Experimental Psychology II, Motivation, Learning, and Thinking. A laboratory course in design, procedures, and report writing of experiments especially in the areas of motivation, learning, and thinking. Prerequisite: Psychology 53 and 112. (3F)

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)

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)

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)

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)

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. (This course and Psychology 206 provide training in advanced educational psychology for graduate students in education and in psychology.) (3 Su)

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)

212. Advanced Applications of Statistics to Education and Psychology. Extending the student's understanding of statistics in psychometrics and in research, this second course covers analysis of variance and covariance, varied correlation techniques, partial and multiple correlation, and non-parametric methods. (3W, Su)

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)

215. Seminar 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)

217. Research for Master's Thesis in Psychology. Credit arranged. (F, W, S)

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)

224. Characteristics of the Mentally Retarded. A study of the characteristics, identification, and treatment of the mentally retarded. Emphasis upon the psychological, social, and educational problems in the treatment and control of the mentally handicapped. (3S)

225. Characteristics and Education of the Gifted Child. A study of the characteristics, means of identifying, guidance, and education of the gifted child. (3W)

235. 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)
238. Practicum in Play Therapy. Direct experience with children in the play therapy situation. (2S) Tschudy

262. Social Psychology of Teaching. Applications of the principles of social psychology in teaching, including study of social structures and dynamics of instructional groups; roles of teacher and students; formation and effects of group norms; and of factors affecting group learning and problem solving, discipline, and self and social development. (3S, Su) Staff

270. Perception. The development, structure, role in behavior, and factors affecting perceptual processes: a study of the theories and experiments. (3F) 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) Sharp

282. Individual Diagnostic Intelligence Testing. Techniques of individual testing, including intensive practice in the administration and interpretation of (a) the Stanford-Binet and Weschler's intelligence scale for children, in the examination of school-age children, and (b) the Weschler'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) Wright

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

287. Occupational Information. Collection, classification, and uses of occupational information in counseling. (2W) Peterson

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) Wright

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) Frandsen

291. 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) Sharp

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) Langer

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) Stone

314. Advanced Independent Study in Psychology. Credit arranged. (F, W, S) Staff

317. Research for the Doctorate Thesis in Psychology. (F, W, S) Staff

386. Problems in Counseling. Individual case studies of children and adolescents presenting problems of diagnosis, guidance, remedial teaching, and psychotherapy. (3F) Wright

388. Internship in School Psychology. Supervised practice in providing psychological services in a school setting. (3F, W, S) Staff
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College of Engineering

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College of

Engineering

Dean F. Peterson, Dean

Office in Engineering and Physical Science 102

The College of Engineering is comprised of the Departments of Civil and Irrigation Engineering, Electrical Engineering, Mechanical Engineering, Tool and Manufacturing 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 and Manufacturing Engineering. The first two years of Chemical Engineering 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 graduate study in Engineering is planned, additional mathematics and physics should be taken.

The objectives of the undergraduate Engineering curricula are to provide thorough, fundamental, technical education necessary for professional Engineering work of the highest grade, and to assure the development of those physical, intellectual, moral, and social qualities essential to high professional achievement. The recommendations of the Engineers' Council for Professional Development have been carefully studied in planning the Engineering curricula, and the curricula in Civil, Electrical, and Mechanical Engineering 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 mission of educating teachers in the industrial fields and of providing high-level technical education necessary for employment in industry.

Nuclear Engineering. A senior sequence of courses in 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 high school units are required for admission without deficiencies:
English, 3; Plane Geometry, 1; Algebra, 2; Trigonometry, ½; Physics or Chemistry, 1. One unit each of Physics and of Chemistry and ½ unit of Mechanical Drawing are recommended. Foreign language in junior or senior high school is desirable. More than four years will be required for deficient students, except that minor deficiencies may be removed by attendance at Summer School. If attended prior to Freshman Fall Quarter, Math 46 should be taken to satisfy a deficiency in Trigonometry; Math 34, to satisfy one in Algebra. If attended prior to the Sophomore year, Math 98 may be taken if deficiency was in Trigonometry only. In any event, students must complete Math 98 prior to entrance to the Sophomore year. Students having minor deficiencies not made up during Summer School, will be admitted conditionally until these are satisfied. Such students deficient in high school Algebra B, register for Math 34, Fall Quarter. Students having major deficiencies may be placed in a pre-engineering program agreed upon by the Dean. Such students may write to the Dean regarding this program.

Based on the entrance examination and high school record, the Dean may waive Math 35 for outstanding students regularly admitted. He may also waive Math 34 for otherwise well qualified students having only one and a half units of Algebra.

For Industrial and Technical Education admission requirements are the same as for general admission to the University.

Scholarship. An average of “C” or higher is required to remain in good standing in the College of Engineering and to be eligible for graduation. The faculty reserves the right to accept toward graduation only credits with a grade of “C” or higher. Prior to continuing the sequence, students must repeat Mathematics or professional sequence courses in which a grade below “C” is received. It is strongly recommended that Physics courses with “D” grades be repeated.

The general University scholastic policy governs the College of Engineering. See “Low Scholarship and Probation” section of catalog. After the first quarter, students who do not maintain a “C” average are placed on probation after one quarter’s warning. Failure to achieve a “C” average after one quarter probation ordinarily results in suspension.

Graduation. Candidates for graduation must satisfy the general University requirements listed in “Academic Regulations,” except, for Engineering students, those pertaining to group requirements. In addition, they must satisfy the requirements of the prescribed curriculum of their major.

Humanities Requirements. Effective with the Class of 1963, graduation in the professional Engineering programs (Civil, Agricultural, Electrical, Mechanical, Tool and Manufacturing Engineering) will require completion of 27 hours in Humanities courses, with a maximum of 10 credit hours in each of not more than four of the following groups:

1. History: 1, 2, 3 or 4, 5, 13, 14, 166, 167, 176
2. Political Science: 1 or 10, 111, 117, 118, 119, 147, 150
3. Literature: English 34, 35, 36, 40, 41, 46, 53, 54, 60, 61
4. Fine Arts: FAA-1, FAM-1, FADr.-1
5. Economics: 51, 52
6. Sociology: 5, 70
7. Philosophy and Religion:
Philosophy 45, 50, 140, 141, 142, 160; all courses in non-sectarian religion taught by Church groups and accepted for credit by Utah State University; Honors 111, 112, and 113.

Computer Center. The University Computer Center maintains a modern electronic digital computer (IBM 1620). The services of this computer are available for classroom instruction as well as for research. Engineering students are introduced to computer programming during their Freshman year and are required to program and compute a number of exercises in their regular professional courses using this machine.

Opportunity for Graduates. Rapidly increasing industrial development, the need for control and development of natural resources, and rapid advances in transportation, manufacturing 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. The College holds institutional membership in the American Society for Engineering Education, American Society for Testing Materials, American Concrete Institute, Highway Research Board and others. Official student chapters of the American Society of Civil Engineers, the American Institute of Electrical Engineers, The Institute of Radio Engineers, The American Society of Tool and Manufacturing Engineers, American Society of Mechanical Engineers, the Sigma Tau (honorary Engineering society) and Theta Tau (professional Engineering fraternity) are on campus. Other student organizations include Industrial Arts Club and Society of Automotive Engineers. Other professional organizations represented by faculty members include, among others, American Association for Advancement of Science, American Geophysical Union, American Road Builders Association, American Society of Agricultural Engineers, American Society of Mechanical Engineers, National Society of Professional Engineers, American Vocational Association, American Industrial Arts Association, American Welding Society, and others.

Students are encouraged to affiliate with the appropriate student societies and participate in their activities.

Engineering Council. The Engineering Council is the over-all student professional Engineering organization. Representatives to the Council are elected from each student professional organization and a chairman is selected from the group. This organization is associated with the Utah Engineering Council and has the responsibility of coordinating all Engineering student activities. It, along with other student chapters, maintains an office in Room 263, Engineering and Physical Science Building.

Honor Societies and Scholarships. The Alpha Delta Chapter of Sigma Tau was installed at Utah State University in 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

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1Air Science officer candidates only
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. The curriculum for all Engineering majors, except for Tool and Manufacturing, Engineering is the same for the Freshman year and nearly the same for the Sophomore year. A student may thus readily delay choice of his Engineering major until completion of his Freshman year; serious loss of credit does not result by such a change as late as the end of the Sophomore year.

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 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 a professional career. On active duty ROTC-trained officers can effectively serve their country in peace or war.

To assist and encourage Engineering students who desire to consider ROTC, the faculty has designated a faculty adviser who will help with schedules and advise regarding other ROTC matters. This adviser is Assistant Professor Arnold Finchum, 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. Application should be made directly to the department concerned.

Concord, Massachusetts, Branch of Electrodynamics Laboratory. A branch of the USU Electrodynamics Laboratory is maintained and operated at Concord, Massachusetts, under an arrangement with the Air Force Cambridge Research Center. This Center is operated by staff members of the Department of Electrical Engineering and Engineering Experiment Station.
Department of

Civil and Irrigation Engineering


Office in E&PS 150

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.

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, hydroelectric plants, and many other works which are a part of the requirements of civilization today.

With properly selected elective courses Civil and Agricultural En-

¹On leave.
Civil Engineering Curriculum

The Civil Engineering curriculum has been accredited by the Engineers Council for Professional Development.

FRESHMAN

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SOPHOMORE

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SENIOR

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Suggested Five-Year Curriculum in Civil Engineering. This curriculum is suggested for students who wish to broaden their education, who wish to take advanced military science or air science, or for those deficient in entrance requirements, or who wish to obtain a better foundation in Mathematics, Physics, or other branches of education. Some students may of necessity have to work a considerable amount of time to stay in school, or they may wish to participate in athletics or other extra-curricular activities. The five-year curriculum is designed to meet these special needs. Those who desire the five-year curriculum should consult their adviser to work out a satisfactory program.

FIRST YEAR

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THIRD YEAR

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²See introductory section on College of Engineering for details of Mathematics and Humanities requirements.

³Two credits are given for M.S. or A.S.
Civil and Irrigation Engineering 117

FOURTH YEAR

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FIFTH YEAR

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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.

*Technical electives may be selected from the following: C.E. 120, 121, 122, 127, 130, 131, 132, 147, 181, 182; A.E. 143, 145, 149, 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.)

All study and research programs must be approved by such a committee before admittance to candidacy for an advanced degree. The study and research program for a particular degree must also satisfy all of the requirements listed in this catalog under the School of Graduate Studies.

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 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. Graduate students, particularly at the doctorate level, may obtain part of their work at other accredited universities upon approval of the Graduate Committee.

Typical Programs of Study and Research

M.S. in Irrigation and Drainage

| Math 140, 141, 142 | 3 | 3 | 3 |
| C.E. 260, 241, 242 | 4 | 4 | 4 |
| A.E. 143, 147, 148 | 3 | 3 | 3 |
| C.E. 299             | 1 |   |   |
| C.E. 298             | 2 | 2 | 10 |

M.S. in Civil Engineering

(Fluid Mechanics)

| Math 136, 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 | 8 |
| C.E. 230             |   |   | 3 |

11 12 12 11

1Programs showing summer credit list only about 12 credits or less per quarter based on the assumption that the student holds a teaching or research assistantship.
Candidates for an advanced degree are given oral and/or written examinations to determine the adequacy of preparation. Additional course work may be required where deficiencies are indicated. 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 BS degree. Longer times are required if students lack background preparation or if the student must have other employment. Additional information may be obtained from the Civil and Irrigation Department or the Dean, School of Graduate Studies.

### PhD in Agricultural Engineering
(Soil and Water)

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### PhD in Civil Engineering
(Hydraulics and Fluid Mechanics)

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### 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)
2. Slide Rule Instruction. Practice in the use of the Log-Log slide rule. Prerequisite or concurrently: Math 46. (1F, W, S) Staff

65. Engineering Problems. How to approach the solution of an engineering problem. Application of mathematics to the solution of elementary engineering problems. Prerequisite: Math 110. One lecture and one lab. (2S) Carter


84. Elements of Surveying. Theory of surveying. Terminology, computations, areas, volumes, field astronomy, and general surveying. Prerequisite: Math 35, 46. Two lectures, two labs. (4F) Daines

85. Advanced Surveying. Problems in leveling, curves, spirals, stadia, plane table, and city surveying. Prerequisite: C.E. 84. One lecture and two labs. (8S) Daines

91, 92, 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. Prerequisites: C.E. 2, Math 99 and Physics 20. Three lectures and one lab. (4F, 4W, 4S, 4Su) Rich, V. Christiansen

105. Elementary Structural Analysis. Analysis of stresses and deflections in statically indeterminate structures. Prerequisite: C.E. 104 or equivalent. Three lectures and one lab. (4S) Carter

106. Elements of Structures. Principles and practices of reinforced concrete analysis and design. Prerequisite: C.E. 105 or equivalent. Three lectures and one lab. (4F) Carter

107. Elements of Structures. Principles and practices of analysis and design of steel structures. Prerequisite: C.E. 105 or equivalent. Three lectures and one lab. (4W) Carter

118. Structural Theory and Design. Design of Steel and Reinforced Concrete Structures. Prerequisite: C.E. 107 or equivalent. Three lectures and one lab. (4S) Carter

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. (3F, 3W, 3S) V. Christiansen

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


129. Engineering Materials. The nature and properties of metallic and non-metallic engineering materials. Includes some testing of engineering materials according to ASTM standards. Prerequisite: C.E. 128 or equivalent. Three lectures. (3S) Cordon


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. 105 is prerequisite for C.E. 131 and C.E. 105 and 106 are prerequisites for C.E. 132. Three lectures. (3W, 3S) 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 of pipes 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 fl uid, 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. (3) Bishop
120 College of Engineering

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) Kief er

151. Soils Engineering. The application of engineering soil mechanics and of structural theory to design of foundations, dams, highways, and other engineering problems. Prerequisite: C.E. 150 or equivalent. Three lectures, one lab. (4W) Kief er

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, mosaic and restituted photographs, their construction and use. Prerequisites: E.D. 63, C.E. 81 or 85, or senior standing in Forestry, Rango or Wildlife Management, Geology, Landscape Architecture, Aeronautics, or Advanced Military Science. Two lectures, one lab. (3F) 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. Students conduct minor research project under direction of faculty. Conducted cooperatively with C.E. 198 and English 111. (1W, 1S) Staff


194. Sewage. 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) Ke pner


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, muliple arch, and deck types of masonry dams. Timber, steel, and miscellaneous types. 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


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
Agricultural Engineering 121

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. Students are expected to develop initiative in pursuing these problems. Formal typewritten reports required. 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


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, hydraulic 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. Prerequisites: C.E. 150 and 250 (may be taken concurrently). (1S) 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

262, 263, 264. Water Resources Engineering. In CE 262 the historical and institutional aspects of water resource development as they relate to engineering project development are covered. The development of other related resources associated with water development projects are also treated. In CE 263 current problems and policies in water resource administration including water laws, compacts, and authorities discussed. In CE 264 general principles and procedures of multiple purpose project planning are covered, including project formulation and evaluation. Prerequisite: Consent of instructor. (3F, 3W, 3S) Bagley

265. Directed Reading and Special Studies in Water Resources. Investigation into problems of special interest in water resources engineering. Given appropriate direction by staff. Discussion periods are arranged. A final report is required. Prerequisites: Consent of instructor. Credit arranged. (F, W, S) Staff


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

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 3S) Kepner

298. Graduate Thesis. Credit arranged. (F, W, S) Staff

299. Graduate Seminar. (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 cur-
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, modern farm and home equipment, and irrigation and drainage. These service courses are open to all university students with the proper prerequisites. They are particularly designed for students in Agriculture and Agriculture Education.

Academic work is supplemented by field trips, which are required as a part of the course work. These field trips provide, under faculty guidance, first-hand study of engineering projects in different stages of completion.

The 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

<table>
<thead>
<tr>
<th>Course</th>
<th>Freshman</th>
<th>JUNIOR</th>
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<td>C.E. 140, 141, 142</td>
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<td>Humanities, C.E. 173</td>
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Senior

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<td>C.E. 190, A.E. 102, C.E. 195</td>
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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

   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

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

104. Senior Project. Involves scaled drawing, cost estimating, construction and formal report on student-selected project. Credit arranged. (S)  
   Staff

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. Two lectures, one lab. (3F) Keller

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) Bishop

Agricultural Engineering 123

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. Three lectures. (3F) 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. Three lectures. (3W) Milligan

230. Special Problems in Agricultural Engineering. Independent study of chosen problems in Agricultural Engineering. Students are expected to develop initiative in pursuing these problems. Standard, formal typewritten reports required. Credit arranged. (F, W, 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
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.

For students planning to participate in the advanced military program, in athletics, work part-time, or who 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

<table>
<thead>
<tr>
<th>Course</th>
<th>Freshman</th>
<th>Sophomore</th>
<th>Junior</th>
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</table>

³See College of Engineering page for details of mathematics and humanities requirements.

²Two credits are given for M.S. or A.S.

¹May be taken any quarter, omitting a humanities course.

Elective must be approved by department head.

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¹On leave.
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 the student's preparation and objectives.

Extended programs of study, in cooperation with the Departments of Physics, Mathematics, and Mechanical Engineering, may lead to the Doctor of Philosophy degree in Electrical Engineering.

Typical course of study leading to the degree of Master of Science in Electrical Engineering:

<table>
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<tr>
<th>Course</th>
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<td>Approved Elective</td>
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</table>

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Electrical Engineering Courses

26. Electrical Engineering Orientation. An introduction to engineering principles and problems; the engineering profession; reports and communications. One lab. (1S) Staff


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. Prerequisite: Physics 21 or equivalent. Three lectures, one lab. (4F) Jones


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 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

119. Applied Engineering Statistics. Application of principles of statistical analysis and probability to engineering problems. Industrial experimentation, quality control, reliability, and operating studies. Prerequisite: Upper division or graduate standing. (3W, S) Staff

120. Antennas. Fundamentals of antennas, radiation and wave propagation; directional arrays; feed lines and matching and phasing networks; antenna and field strength measurements. Prerequisites: 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: 9.9.81, 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 electromagnetic 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


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 Computer Programming. Discussion of problem-oriented programming languages (compilers). The use of a compiler language to write programs for a computer. Students are expected to learn a programming language and solve problems in their own field using a computer. Two lectures, one lab. Prerequisites: Math 35. Also listed as Computer Science 167. (3F, W, S) 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. **Pulse Circuits.** Analysis and design of tube and transistor static and regenerative circuits, including pulse shaping circuits, multivibrators, and blocking oscillator circuits. Prerequisite: E.E. 180. Three lectures, one lab. (4W) Finchum

182. **Digital Circuits.** An introduction to counters, shift registers, logic circuits, and information storage devices used in digital systems. Prerequisite: E.E. 181. Three lectures, one lab. (4S) Finchum

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 immitances. Prerequisite: E.E. 112. (3F, 3W) Watkins

231, 232, 233. **Electromagnetic Fields and Waves.** Advanced static and dynamic electric, current, and magnetic field theory; Maxwell's equations; wave equations; solution of electromagnetic field and wave problems in coordinates appropriate to various wave structures; nonclassical electrodynamics. Prerequisite: E.E. 139 or Physics 175. Three lectures. (3F, 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, one lab. (4S, 4Su) Horsley

251. **Servomechanisms and Automatic Controls.** Advanced theory and design of linear servo systems. Feedback synthesis. Transient response and stability problems. Introduction to non-linear systems. Prerequisite: E.E. 160 or equivalent. Three lectures. (3S) 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)


Office in Engineering and Physical Science 168

Mechanical engineering is the design and development of machines. Machines are 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 engineering, industrial engineering, space engineering, thermodynamics, heat transfer, machine design, power production, systems engineering, management, equipment 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. Consequently 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 industry or to continue specialization in graduate study.

Up-to-date laboratory facilities, including a sub-critical nuclear reactor, are utilized in the undergraduate as well as graduate program.

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.

Mechanical Engineering Curriculum

The mechanical engineering curriculum is accredited by Engineers Council for Professional Development.

<table>
<thead>
<tr>
<th>Course</th>
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<td>Math 35, 97, 98</td>
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<td>English 1, 2, 3</td>
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<td>C.E. 1, 2</td>
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<td>C.S. 1</td>
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<td>Humanities¹</td>
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<tr>
<td>M.S.,² A.S.,² or P.E.</td>
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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:

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<td>M.E. 298</td>
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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.

Mechanical Engineering Courses


Note: Do not purchase drafting instruments before first class in the next three courses:

6. Elementary Drafting. Lettering, use of instruments, and fundamentals of drafting. Open only to forestry students. One lab. (1W) Smith

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**

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) **Staff**


110. Heat Engines. Introduction to elementary thermodynamics and basic heat power cycles. Prerequisite: Physics 19. Three lectures, one lab. (4W) **Staff**


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) **Holdridge**

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 concurrently. Three lectures and one lab. (4S) **Holdridge**

120. Engineering Measurements. Basic engineering measurements, theory and techniques; error analysis, data reduction and rejection; Analysis of data by graphical, statistical, and mathematical means; experiment planning. Prerequisite: Math 99. Three lectures, one lab. (4S) **Staff**

130. Kinematics of Machines. Analysis of displacement, velocity, and acceleration in mechanisms by graphical and analytical methods. Velocity and acceleration polygons. Kinematic design of cams, belts, toothed gearing, gear trains, computing mechanisms, etc. Introduction to synthesis. Complex numbers in kinematics. Calculation of velocities and accelerations by complex numbers. Prerequisite: C.E. 102. Two lectures, two labs. (4F, 4S) **Eisenstein**

131. Machine Analysis. Basic analytical tools for the design of machines. Application of principles of engineering mechanics, strength of materials, and kinematics in machine analysis. Combined stresses; theories of failure; variable loads, repeated and impact; fatigue; stress concentration; statically indeterminate members; deflection-energy methods; curved beams; thick shell cylinders; flat plates; critical speeds. Prerequisites: C.E. 104, M.E. 130. Three lectures, one lab. (4F) **Eisenstein**

132. Machine Design. Application of the method of stress analysis to the design of machine components. Analysis of static and dynamic forces and stresses in machine elements. Design of machine part by rationalisation and empiricism. The main topics are: fastenings, power screws, pressure vessels, springs, shafting, coupling, clutches and brakes, bearings with sliding and rolling contact, lubrication, etc. Prerequisite: M.E. 131. Two lectures, two labs. (4W) **Eisenstein**

133. Machine Design Projects. Analysis and design of power transmitting devices, gearing, Flywheel analysis. Introduction to experimental stress analysis theory and technique. Design project and report course covering design procedure and application of general theories of machine design including design of mechanical systems involving stress analysis and dynamic. Students work individually or in small groups under active guidance of staff members on substantial approved projects. References are made to research publications and experimental procedures. Prerequisite: M.E. 132. Two lectures, two labs. (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 vibration. Application of theory to practical problems of rotating and reciprocating machines; balancing of machinery. Analysis of dynamic forces in machinery. Two lectures and one lab. (3S) **Eisenstein**
143. Gas Dynamics. Fundamental concepts of fluid mechanics and thermodynamics, isentropic flow, shock waves, constant area flow, flow with heating, generalized one dimensional flow. Prerequisites: M.E. 114, C.E. 102, and C.E. 141. Three lectures, one lab. (4S) Holdredge

150. Science of Materials. The basic principles of solid state physics are used to explain the engineering properties of materials including metals, alloys, ceramics, plastics, etc., with temperature range from ultra-high to cryogenics. Prerequisite: Physics 22. Three lectures, one lab. (4S) Shupe

160. Engineering Analysis. Many of the mathematical tools which are used in senior and graduate courses are introduced and applied to sample problems from fluid mechanics, advanced dynamics, gas dynamics, thermodynamics, and heat transfer. Specific topics include the mean value theorems, vector calculus, derivation of differential equations, line integrals, and Fourier Series. Prerequisite: Math 110. Four lectures. (4F) Vendell


162. Mechanical Vibrations. Free, damped, and forced vibration of systems with n degrees of freedom, matrix iteration technique, the method of Holzer, vibration of elastic bodies. Prerequisite: M.E. 161. 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, flexure, and torsion; and with special application to thick-walled cylinders, discs, curved beams, unsymmetrically and eccentrically loaded members; and photoelastic analysis. Prerequisites: Math 110 and C.E. 104. Four lectures. (4S) Watkins


185. Rocket Engines. Basic principles of rocket engines including control mechanisms for both solid and liquid propellant engines. Prerequisite: Chemistry 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) Shupe

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) Vendell

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) Vendell

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
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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.) Five lectures. (5F) 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) Holdredge


298. Graduate Thesis. Credit arranged. (F, W, S) Staff

Department of Tool and Manufacturing Engineering

PROFESSOR Frederick Preator, HEAD; ASSISTANT PROFESSORS Rawson D. Child, W. K. Somers.

Office in Mechanical Arts 101

The Tool and Manufacturing Engineering 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 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 students, which recognizes their summer work done in industry. 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

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#### Tool and Manufacturing Courses

50. **Orientation.** Lectures, and films to acquaint the student with the work of the Tool and Manufacturing Engineer. (IS) **Staff**

52, 53. **Production Processes.** Shaper, milling, and grinding operations. Prerequisite: TME 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 limitation 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 of applications in industry are reviewed. Prerequisite: Chemistry 10. Three lectures, one lab. (4F, W, S) **Preator**

151. **Toothing Systems—Operations.** Develops an understanding of the capacity and versatile usefulness of the fundamental machines and equipment used in manufacturing engineering. Prerequisite: TME 53. Two lectures, two labs. (4F) **Child**

152. **Toothing Systems—Planning.** Deals with the analysis of the product design, planning procedures, routing methods, and the organization of the operational sequence. Prerequisite: TME 151. Two lectures, two labs. (4W) **Child**

153. **Toothing Systems—Standards.** Studies the utilization of standard equipment, standard tooling and standard gaging methods adapted to the manufacturing process. Prerequisite: TME 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: TME 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: TME 153. (5W) **Somers**

182. **Die Design.** Emphasizes design and application of tooling to materials and products fabricated by press working production methods. Prerequisite: TME 181. Three lectures, two labs. (5S) **Preator**

¹See College of Engineering p. ...... for details of mathematics and humanities requirements.

²Two credits are given for M.S. or A.S.
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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: TME 148. Two lectures, one lab. (3S) Somers


185, 186. Co-operative in Plant Training. A co-operative training course conducted by the university and industry to supplement academic work with tool and manufacturing experiences. A satisfactory report from industry is required. 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


Office in Mechanical Arts 105

Beginning as the Department of Mechanical Arts in 1888, this department 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. Through the years, USU has recognized its obligation in this respect and has endeavored earnestly to keep its training programs abreast of the times.

The Department of Industrial and Technical Education offers two types of training programs: The first one is a program in Industrial Teacher Education. Majors in Industrial Arts Education and Trade and Industrial Education are offered in this program. The second one is the Industrial Technology program which offers majors in Aeronautical Technology, Automotive Technology, and Welding Technology. The department also has a two-year program in Technical Education.

(1) Programs for Industrial 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. The completion of the undergraduate curricula lead to the degree of Bachelor of Sci-
ence 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 students as technicians 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.

(III) Two-year Technical Education 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 students are well prepared with the technical skills and knowledge in the field of their choice and through their association and activities on a university campus they are prepared to assume their role as worthy citizens. 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 one may apply most of the credit earned under this program toward a degree, and thus better prepare himself 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.

Programs in

Industrial Education

Curricula are offered for the professional training of teachers, supervisors, and administrative
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staff in Industrial Education. In addition, courses in woodwork, metal work, drawing, leather, electricity and electronics, and plastics are offered. Upon completing undergraduate courses students 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, education, technical and professional industrial arts, and basic shop skills.

Industrial Arts Education Curriculum

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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 the student must show evidence of successful trade and teaching experience, together with the general education requirements necessary for state certification in his chosen 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

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1If a student has completed high school Algebra B and makes a satisfactory grade on the mathematics entrance examination, he may omit Math 34 and begin with Math 35 in the fall quarter.

2Two credits are given for M.S. or A.S.
SOPHOMORE

Course                      F  W  S  
Trade Training             5  5  5  
Physics 17, 18, 19         5  5  5  
Biological Science Group   5  5  5  
Sociology                  5  5  5  
Approved Electives         2  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  
Language and Arts Group   3  3  3  
Speech 21                 3  3  3  
Economics 51              5  5  5  
Phychology 100, 102       3  3  3  
I.E. 101, Ed. 118         1  3  3  
I.E. 118, 120             3  3  5  
Education 114            3  3  5  
Public Health 154 (or 155—4 cr.) 3  3  5  
Electives                 6  5  5  

17  17  17

SENIOR

Course                      F  W  S  
Adv. Trade or Tech.       3  6  6  
I.E. 107, 110             3  3  3  
I.E. 121, 129             3  3  3  
I.E. 112                 9  9  9  
I.E. 102                 3  3  3  
English 111              3  3  3  
Economics 125            3  3  3  
Electives                7  4  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)  

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)  

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)  

15. Technical Drawing. Lettering, use of instruments, sketching, multiview drawings, reading and interpreting blueprints, and non-technical charts. One lecture, two labs. (3F, W)  


19. Aircraft Drawing. Aircraft drafting techniques, numbering systems, change methods, and technical specifications. Prerequisite: I.E. 17 or M.E. 22. One lecture, two labs. (3S)  

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)  

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. Prerequisites: TME 56, Welding 97. (3S)  

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)  

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)  

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)  

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)
138 College of Engineering

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, W, S) 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 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. Students 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. Prerequisite: I.E. 107. (3W) Staff

104. Occupational Analysis. Principles and practice in analyzing occupations. Students complete an analysis of one unit for a trade or occupation. (3F, W, Su) Staff

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 students to organize and manage an Industrial Education Shop of the unit, general, or multiple activity type. Students prepare for one type of shop, a complete plan of organization and management dealing with the necessary equipment, materials, supplies, methods of purchasing, financial control, and problems of shop arrangement. Prerequisite: I.E. 107. (3W, Su) Hailes


112. Student Teaching in Industrial Education. Students observe and teach in Industrial Arts shops throughout the state. Under close supervision, they 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 each student. Credit arranged. (F, S, Su) Willey

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, pictorial and technical illustration. Prerequisite: I.E. 17. (5F) Wallis

*116. Industrial Drafting. Techniques in basic drafting, 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) Staff

*Taught 1962-63
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. Students 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) 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. 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 students 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. Students should not expect to acquire more than three credits in this course in any one calendar year except where teacher training courses are of longer duration. Regular university fees must be paid, and registration procedures followed. Credit arranged. Staff

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

**Taught 1963-64.**
140 College of Engineering

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

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, woodworking, and crafts. Designed especially for teachers needing special work in one or more areas. (3Su) Halles, 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

196. Philosophy of Vocational Education and the Practical Arts. Designed to enrich and expand understanding of the nature and purposes of vocational education and practical arts, their relationships and differences, and the place each phase of the work should have in a public school program. 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) 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, S) 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) 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) 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) Mortimer

270. Seminar in Industrial Education. Gives opportunity for investigation and reporting of individual problems. (1 to 2F, W, S, Su) Mortimer

Two-Year Programs in Technical Education

Any one of the two-year technical education programs prepares the student 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 those who do not plan to obtain a Bachelor's Degree, yet it fulfills some of the requirements for the degree where students decide later to continue their studies.

The completion of any program entitles the student 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. The student selects his particular area of specialization and then registers for the courses outlined below.

### Core Curriculum

#### FIRST YEAR

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<td>TME 56</td>
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#### SECOND YEAR

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<td>I.E. 118, 120</td>
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<td>LE. 71, Weld. 97</td>
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#### SPECIALIZATION

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<td><strong>Diesel Curriculum</strong></td>
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Industrial Technology

Four-year Degree Program.

There are three different majors offered in the Industrial Technology program, namely, Aeronautics, Automotive, and Welding. The curriculum for Aeronautics and the basic courses for the major are listed in the Aeronautics section. Students registering with majors in Automotive Technology or Welding Technology register in the General Curriculum below. The basic courses constituting the major area in Automotive are listed in the Automotive Section; those constituting the Welding major area are listed in the Welding Section.

Industrial Technology Degree Curriculum

<table>
<thead>
<tr>
<th>Course</th>
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Approved upper division electives are as follows: Econ. 166, 126, 127, 170, 180; Bus. Admin. 140, 171, 172, 185; Soc. 158; I.E. 102, 104, 144; Speech 109; Pol. Sci. 117, 118, 119; Psy. 155; C.E. 180; TME 146, 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 students to apply for FAA airframe and powerplant mechanic ratings. As a graduate in the four-year curriculum students are required to have successfully accomplished the written and practical FAA examinations for these ratings. This training prepares technicians 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 the student to a point

1 See footnote page 154.

2 Two credits are given for M.S. or A.S.

3 See footnote page 155.
where he 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

**FRESHMAN**

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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 4F) *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*

9, 9a. **Aircraft Powerplant Accessories.** Operation, repair and maintenance of modern aircraft engine accessories, including design, fuel systems, carburetion and carburetors, fuel, injection systems, magnetos, generators, and voltage control system, batteries and starters, and fuel pumps. Application and compliance with pertinent Civil Air Regulations. Basic related material includes combustion and combustible mixtures, electricity...
and magnetism, induction systems and superchargers, fuels and lubricants. Five lectures, five labs. (4 and 4W)  

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: Aeronautics 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: Aeronautics 100. Two lectures, one lab. (3W) Summers  

103. Elementary Aircraft Design. Basic constructional concepts relating to aircraft design. (3F) 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 of 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, Aeronautics 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 Aeronautics 34. Credit arranged; limit 10 credits. (F, W, S) Staff  

Automotive Technology  

Students majoring in Automotive or Diesel Technology will register in the General Industrial Technology Degree Curriculum. The courses which make up the major area in Automotive Technology are as follows: Automotive 1, 2, 3, 4, 5, 6, 101, 102, 103, 151, 152, 162, I.E. 113.  

The major area in Diesel Technology consists of the following courses: Automotive 21, 22, 23, 4, 5, 6, 101, 103, 122, 151, 152, 162, I.E. 113.  

The following courses are also required in Auto & Diesel: Welding 91 and 94 in the Freshman year, Chemistry 12, and Welding 190 or 191.
Training programs leading to a Bachelor of Science degree are offered both in 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 modern 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 the student to be a technician well trained to interpret the designs of engineers and direct the work of skilled craftsmen. This major also prepares one 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


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. Prerequisite: Automotive 2, 4, 5. (5S) Slaugh

12. Fender Reconditioning. Modern processes of straightening and priming fenders. (5F) 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
146 College of Engineering

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 upholstering processes. Students upholster their own units as they 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: Automotive 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: Automotive 2, Math 44. (3W) Slough

103. Automatic Transmissions. Includes modern automatic transmissions and torque converters, electric clutches, and hydraulic systems. Prerequisite: Automotive 3. (3W, S) Hurst

122. Fuel Injection Systems. Various types of Diesel and gasoline injection systems are included. Modern testing equipment is used. Prerequisite: Automotive 22. (3W) Hurst

151. Carburetion. Combustion processes, heat cycles, and fuel characteristics are studied in connection with internal combustion engine carburetion problems. Prerequisites: Automotive 4, Math 35. (3F) Slough

152. Motors, Generators, and Magneto. An advanced course covering technical phases of these units. Laws of Physics are applied. Prerequisites: Automotive 5 and preferably Physics 19. (3W) Slough

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 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 students 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 practices 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 students 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 the student 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 for welding code tests. Special cutting problems, inspection and management, and welding metallurgy. Prerequisite: Welding 48. (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

Department of Clothing and Textiles, 152
Department of Family and Child Development, 153
Department of Food and Nutrition, 156
Department of Homemaking Education, 159
Department of Household Economics and Management, 161
Combination Major in Family Life and Office Administration, 163

Degrees Offered:
   Bachelor of Science
   Master of Science
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 two-fold: First, to help one prepare for more effective living in the home and the community; second, to help one prepare for a professional career in an area of his or her choice.

Professional opportunities open to a graduate of the College of Family Life include teaching, extension service, business, institutional management, dietetics, research in Family Life, and working with children in nursery schools, day-care centers, and in hospitals.

The five departments in this college are: Clothing and Textiles, Family and Child Development, Food and Nutrition, Household Economics and Management, and Homemaking Education.

Bachelor of Science and Master of Science degrees are offered in each of these programs. Courses may be arranged so that one can obtain an MS degree work in Summer School, providing that the research project is done on the job during the winter months.

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:

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

105. Demonstration Techniques. Purposes and techniques of demonstrations with application to Family Life teaching in schools, extension, business, and social service. Field trips to nearby areas may be planned. (2W, Su) Snow

190. Independent Study. For qualified students upon consultation with the instructor. Credit arranged. (F, W, S, Su) Staff

290. Independent Study. For qualified students upon consultation with instructor. Credit arranged. (F, W, S, Su) Staff

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. Students may select those courses most appropriate to their personal needs and interests.

CT 8 Basic Clothing Construction
15 Clothing Selection for Men
24 Textiles
185 Family Clothing

FCD 20 Preparation for Marriage and Family Living
67 Early Childhood
120 Marriage

FN 24 Principles of Nutrition
24a Principles of Food Preparation
25 Meal Preparation for the Family

HEM 149 Home Management
155 Family Finance
The Department of Clothing and Textiles offers work leading to the Bachelor of Science degree in the areas of Clothing and Textiles, Fashion Merchandising, and Textile Technology and Research.

**Clothing and Textiles.** The curriculum for a major in Clothing and Textiles includes the following courses: FL 5; CT 8 or equivalent, 24, 25, 105, 112, 125, 141, 165, 170, 175, 185 and 191 and an additional fifteen to eighteen credits to be selected from Visual Arts 135; Psychology 161; Sociology 130, 140, 154, 165; Economics 107, 171, 172, and Political Science and History.

Majors are also required to take Chemistry 10, 11, 12, and Philosophy 50 as part of their lower division requirements.

If students desire a minor in Clothing and Textiles, they should include FL 5, CT 8 or its equivalent, 24, 25, plus eight hours credit selected from other courses included in the CT major.

**Fashion Merchandising.** If one is preparing for Fashion Merchandising, she 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, 156, and 161.

**Textile Technology and Research.** If preparing for Textile Technology and Research, one should complete a double major in CT and Chemistry.

### Graduate Study

**Master of Science.** The Clothing and Textiles Department offers study and research to qualify candidates for a Master of Science degree.

### Clothing and Textiles Courses

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: FL 5. (3F, W, S) Pierson

15. **Clothing Selection for Men.** Men's apparel as related to the wearer. Consideration is given to fundamentals of fabric and garment selection. Organized to meet the needs of men in all colleges of the University. (2W) 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 FL 5. (3F, W, S) Clayton, Pierson

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) Clayton, 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: FL 5. Recommended Visual Arts 5, 135. (2S) Clayton, Terasawa

125. Draping. Creative experience in dress designing by draping on the dress form. Emphasis placed in 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. (3W) Terasawa

141. Weaving. Fundamental principles of weaving. Emphasis on weaving for practical use—place mats and napkins, aprons, skirts, or blouse materials. (3F, W, S) Terasawa

155. Tailoring. Application of techniques used in tailoring suits and coats. Prerequisite: CT 25. Recommended CT 125. (3F, W, Su) Terasawa

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. (3S) 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 Chemistry 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. (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 economies of clothing; analysis of the fashion industry; economies of manufacture and marketing clothing. Taught as required. (3) 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. Taught as required. Staff


**Taught 1963-64.

Department of
Family and Child Development

PROFESSOR DON C. CARTER, HEAD; ASSOCIATE PROFESSORS DOROTHY B. LEWIS, C. JAY SKIDMORE; INSTRUCTORS MARILYN BLAYLOCK, CARROLL C. LAMBERT; HEAD TEACHER IN CHILD DEVELOPMENT LABORATORY AND CO-OPERATIVE NURSERY VALERA G. HOLMAN.

Office in Family Life 118

The Department of Family and Child Development offers work leading to the Bachelor of Science and Master of Science degrees. See the Graduate School catalog for the Master's degree program.

Three separate majors are available for either graduate or undergraduate study. Students may select the one in which they are most interested: (1) Child Development; (2) Composite major in Child Development and Elementary Education; (3) Marriage and Family Relations. Each major represents a desirable area of study if one is
interested in children or family life, either professionally or as a parent or future parent.

The major in Child Development should prepare one 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 Relations should contribute to one's 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 counseling or family relations.

Child Development Major. The curriculum for a major in Child Development includes: FCD 108, 130, 174, 175 with an additional eighteen credits to be selected from FCD 67, 68, 77, 100, 115, 120, 125, 150, 158, 164, 180, 185 187; FL 5; CT 185; English 122; FN 24 and 24a, 141; FAA 50; HEM 149, 155; P. E. 81, 83, 84; Psychology 112, 123, 135, 145; Sociology 130, 156, 171, 172; Social Work 165, 177; Speech 118, 167; Zoology 102.

Composite Major in Child Development and Elementary Education. The curriculum for a major in Child Development, for students who wish to be certified to teach in Elementary Education, includes: FCD 108, 130, 174, 175, with an additional 24 credits to be selected from FCD 77, 120, 150, 164; English 122; Education 133; FAA 50 or 151; FAM 150; FN 24; P. E. 81, 83; Speech 118. The composite major eliminates the need for a minor.

Child Development Minor. To minor in Child Development one should take FCD 108, 130, 150, 174 and 175. 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 Relations Major. The curriculum for a major in Marriage and Family Relations includes: FCD 67 or 100, 120, 150, 180, 187; HEM 155 or Business Education 85; Sociology 160 or Social Work 165; Psychology 112; Zoology 102 and nine hours selected from supporting courses in related fields.

Marriage and Family Relations Minor. The curriculum for a minor is: FCD 120, 180, 187 and either 67 or 100, with at least six credit hours selected from other courses included in the Marriage and Family Living major.

Teacher Certification. To teach in kindergarten or elementary school, as a Child Development major, or in high school as a Marriage and Family Relations major, a student must meet the state requirements for teacher certification. It is recommended that a student take a teaching certificate with his major. The teaching certificate fills the requirements for a minor for graduation in child development. Majors in Marriage and Family Relations should take a teaching minor in some subject commonly taught in the high school.

Counseling Service. The Department of Family and Child Development provides pre-marital, marriage and family counseling for students, as part of a University-
Family and Child Development 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

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. (3F, W, S) 
   Lewis, Blaylock

68. Preschool Laboratory. Directed observation in the Child Development Laboratory. Recommended to parallel FCD 67. (2F, W, S) 
   Blaylock

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, Su) 
   Lewis

100. Human Growth and Development. Growth and development from birth to maturity. General behavior patterns characteristics of different levels of maturity; individual differences and needs. Prerequisite: Psychology 53. (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. Prerequisites: FCD 67, 68. (3F, W, S, Su) 
   Lewis

115. Growth of the Infant. Readings in child development from conception to fifteen months of age, with discussion of infant care. Prerequisite: FCD 67. (3W) 
   Lewis

120. Marriage. Engagement; marriage relationships; understanding of self. For men and women. (3F, W, S, Su) 
   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) 
   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 ongoing programs. (1-3 Su) 
   Staff

130. Play and Play Materials. Meaning of Play and its value in early childhood. Consideration of attitudes and materials which foster creative expression in the young child. (3F, S) 
   Blaylock

135. An Introduction to the Theory and Practice of Play Therapy. See Psychology 135. (3F) 
   Tschudy

150. Seminar. Discussion of topics in current literature plus independent reading selected according to your interest. (2W, S) 
   Carter

158. Sex Education. Problems and procedures in teaching sex education to children, preschool through adolescence. Taught as required. (2) 
   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. Methods and techniques of guidance of pre-school children individually and in groups, with emphasis on the study of one child. Readings in research on pre-school children. Must parallel FCD 175. (3F, W, S, Su) 
   Lambert

175. Practice Teaching in the Nursery School. Experience in application of generalizations regarding guidance, growth, and development of children in the nursery school. For juniors and seniors who have had a substantial amount of professional course work, including FCD 108 and 130. Arrangements must be made for practice teaching well in advance of registration. (6F, W, S, Su) 
   Lambert

180. Marriage Counseling. The philosophy, principles, and techniques of pre-marital and marriage counseling. (3W, Su) 
   Skidmore

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.
156 College of Family Life

185. The Family in the Middle and Later Years. Family development, and problems of grown children and their parents; parents on their own; understanding older family members. (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) Skidmore

190. Independent Study. See Family Life 190. Credit arranged. (F, W, S, Su) Staff


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. (3Su) Staff

235. Observation and Case Analysis in Play Therapy. See Psychology 235. (3W) Tschudy

238. Practice in Play Therapy. See Psychology 278. (3F, W, S) Tschudy

250. Advanced Seminar in Family Living and Child Development. Discussions of current readings in family living and child development, with emphasis on development of sight and self-understanding. (3F, 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. (W, S, Su) Lambert

290. Independent Study. See Family Life 290. 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 Dexter Rogers, Priscilla Rowland; INSTRUCTOR Margaret B. Merkley.

Office in Family Life 104-D

The Food and Nutrition Department can contribute importantly to life and provide valuable experience in personal and family living. The curriculum to prepare one for high school teaching includes FN24, 24a, 25, 140, and one other upper division course.

The two majors in the department are (a) Food and Nutrition and (b) Dietetics. A student majoring in Food and Nutrition is prepared for positions in food, nutrition and research. A major in Dietetics is prepared to take a student internship in an approved hospital, university or industrial plant operation which qualifies an individual as 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, 24a, 25, 107, 140, 141, 145, 146 and 180, and a minimum of eighteen hours in other areas in the College of Family Life. Classes recommended in these areas are: FL 5, CT 8, FCD 20 and 67, HEM 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; see adviser regarding allowances for variations):

<table>
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<tr>
<th>Group</th>
<th>Quarter Hours</th>
<th>Courses</th>
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| Group I | 12-15 | Basic Food, required Nutritio
| | | n, required (Prerequisite or concurrent—3 courses from Group II) |
| Group II | 30-37 | Inorganic Chemistry, Chemistry 10, 11 Organic Chemistry, Chemistry 12 Human Physiology, Physiology 4 Bacteriology, Bacteriology 10 or 70 Physiological or Biological Chemistry, Chemistry 190 Food Chemistry Physicals, Physics 6 |
| Group III | 18-30 | Psychology, Psychology 53, 102 Education, Homemaking Education 120 Sociology, Sociology 70 Anthropology Economics, Economics 51 Personnel Relations |
| Group IV | 18-37 | Experimental Foods 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 of the College of Family Life, can select a minor in the Food and Nutrition Department.

Courses recommended for a minor are FN 24, 24a, 25, 140, plus five additional hours to be selected by the student from other courses offered by the department.

Graduate Study

The Master of Science degree is offered in Nutrition (Animal and Human) and Biochemistry Inter-departmental Curriculum. (See Graduate School, 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, Nutrition and Biochemistry.) Detailed information may be obtained from the department.

Food and Nutrition Courses

24. Principles of Nutrition. The relation of food to health; factors influencing nutritive requirements; problems applicable to individual interests. May be taken without 24a. (3F, W, S) Rowland, Schoulte

24a. Laboratory for Nutrition and Food Preparation. A laboratory to parallel 24. The influence of such factors as kind and proportion of ingredients, manipulation, and method of cooking on nutritive value and acceptability of foods. (3F, W, S) Rowland, Schoulte

25. Meal Preparation for the Family. Planning, preparing, and serving family meals with consideration of the nutritional needs and finances of the family. Prerequisites: FN 24, 24a. Schoulte, Merkley

100. Quantity Food Preparation for Homemaking 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, 24a. (3S) 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. (2S) Wilcox

*Taught 1962-63.
158 College of Family Life

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. Prerequisites: Organic Chemistry, FN 24 and 24a or 140 or equivalent. (SF, W) Merkley

141. Child Nutrition. Nutritional requirements of the mother during pregnancy and lactation; nutrition and child from infancy through adolescence. Prerequisites: FN 24, 24a or 140 or equivalent. (2S) Wilcox

**145. Diet Therapy.** Application of dietetic principles to problems of disease, with calculations and preparation of diets in diseased conditions. (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, and 24a. One lecture and one lab. (2F, S, and alternate summers. Offered Su 1963.) 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 personal 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


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 determinations. Prerequisite: Organic Chemistry. (2S) Wilcox


203. Nutrition Laboratory. Micro-chemical determination of vitamins and other constituents in small amounts of blood. Prerequisite: Chemistry 190 or equivalent. (2W) Wilcox

207. Advanced Experimental Foods. Development of experimental method and its application to cookery, and preparation of independent investigation of foods. Credit arranged. Taught as required. Staff


243. Nutrition and Growth. Relation of nutrition to growth from the prenatal period to old age. (2S) Wilcox

290. Independent Study. See Family Life 290. Credit arranged. (F, W, S, Su) Staff

291. Graduate Seminar. (Nutrition and Biochemistry Seminar. See A.H. 270.) (1W, Su) Staff


*Taught 1962-63.
Homemaking Education

ASSISTANT PROFESSOR Virginia H. Harder, HEAD; INSTRUCTOR Norma W. Pierson.

Office in Family Life 209

Homemaking Education is professional training for teaching homemaking in the secondary schools. In addition it provides valuable experiences for 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 students should keep in mind Homemaking Education prerequisites: Psychology 53 and Chemistry 10, 11, and 12.

The composite major requirements are: Clothing and Textiles 24, 25, 165 and 125 or 170; Family and Child Development 67, 68, 108 and six hours selected from FCD 77, 120, 125, 180, 185, 187 or Psychology 202; Food and Nutrition 24 and 24a, 25, 140 and a three-hour class selected from FN 100, 107, 135, 141, 146; Household Economics and Management 65, 75, 100, 149, 150, 155; Family Health 152; Family Life 5.

During spring quarter of the junior year an evaluation will be made by the CT department of a student's competencies in relation to those considered basic for teaching in this area and recommendations made.

It is recommended that a subject interest be developed into a teaching minor: e.g. English, Business, Music, Physical Education, Social Science, Chemistry, Journalism, etc.

Certification Requirements for Teachers of Vocational Homemaking in Secondary Schools: Family and Child Development 100 or Psychology 100; Psychology 102; Public Health 154 or 155; Education 111 and 114; Homemaking Education 120, 121, 122, and FL 190.

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 selected for research. It is desirable that a graduate committee be established during the student's first quarter of residence. This committee will thereafter approve his graduate study program and will guide him 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 Services 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 Services 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; 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 Services.

Homemaking Education Courses

120. Methods in Teaching Homemaking. Guiding pupil development in basic classroom procedures. Curriculum planning with appropriate use of textbooks, audio visual materials, home experiences and practices, 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 students register with the instructor of Homemaking Education 121 and 122 one quarter prior to student teaching. This provides the time necessary to arrange teaching assignments with cooperating schools. (4F, W) Harder

122. Student Teaching in Homemaking Education. Observation and teaching of homemaking under supervision in public schools having cooperative arrangements with this University. Student teacher leaves campus the middle five or six weeks of the quarter and teaches a full homemaking program each day in an approved school. Prerequisites: Homemaking Education 120, 121. (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. Students may arrange with instructor to substitute this course 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

Department of

Household Economics and Management

ASSOCIATE PROFESSOR Rhea H. Gardner; ASSISTANT PROFESSORS Edith Nyman, HEAD, Haruko Terasawa, LaVina Harper.

Office in Family Life 204-B

This department attempts to clarify the scope and meaning of management in the home and to help one recognize and use intelligently the many resources available. It aims also to help one understand the relationship between general economic conditions and economic problems of families and to provide a background for intelligent civic action in furthering human well-being.

A major in this department contributes to professional preparation in Consumer Economics, Family Economics Counseling, Home Service, Research and other home economics positions in business and Extension Services. A Master’s degree prepares students for university teaching.

Courses in other colleges of the University which are related to work in Household Economics and Management are: Economics, Chemistry, Agricultural Economics, Political Science, Physics, Psychology and Sociology.

A minor developed in the area of Economics, Physics, Psychology, Radio-TV, Journalism, Speech, Foods and Nutrition, Clothing and Textiles or Family and Child Development, provides additional training for employment.

Major. The following courses are required for a Bachelor of Science degree: HEM 100, 149, 155 and 150 or 151, and 27 hours selected from: HEM 65, 75; AN 185; BA 20, 100, 151, 185; Economics 106, 150, 172; Political Science 1, 160; Sociology 5, 130, 140, 141, 160; Social Work 165; Electrical Engineering 21, 22; Tool and Manufacturing Engineering 180; Physics 6, 17, 18, 19; Chemistry 10, 11, 12; Psychology 161.

Minor. The curriculum for a minor includes: HEM 100, 149, 155 plus three additional credits in the department and an additional six hours in any other one department of the College of Family Life or from one of the other departments supplementing the major.

Graduate Study

The Department of Household Economics and Management offers work leading to the Master of Science degree, emphasizing the areas of Family Finance, Household Equipment and Home Management. Flexibility in program planning provides opportunities for developing individual strengths and interests. Course work is arranged in cooperation with other departments of the University such as Economics, Sociology, Psychology, Physics, Family and Child Development, Food and Nutrition, and Clothing and Textiles.
Household Economics and Management Courses

65. **Housing.** A consideration of various aspects of housing: finance, location, planning and orientation, construction, remodeling and expansion. (3F, W, S) *Harper*

75. **Home Furnishings.** To help develop an appreciation of Home Furnishings, their construction, selection, use and care. Recommended HEM 65, FL 5 or its equivalent. (3W, S) *Terasawa*

100. **Household Equipment.** Principles of selection, operation, care and arrangement of household equipment. (3F, W, S) *Harper*

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; HEM 149. (4F, W, S, Su) *Harper*

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. (3F, 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 Office Administration

This is a program for women who desire basic education for Family Life plus sufficient secretarial training to provide for professional opportunities outside the home. For a Bachelor of Science degree with this combination major students complete the Family Life and Secretarial courses here listed, plus the University group requirements listed in the catalog.

Family Life Courses

42 hours with not less than 9 in any department

**Household Economics and Management**
- HEM 65 Housing ........................................... 3
- HEM 75 Home Furnishings ........................... 3
- HEM 100 Household Equipment ....................... 3
- HEM 149 Home Management .......................... 3
- HEM 150 Home Management House ................. 4
- HEM 155 Family Finances ............................. 3

**Clothing and Textiles**
- CT 8 Basic Clothing Construction .................. 3
- CT 24 Textiles ........................................... 3
- CT 25 Intermediate Clothing Construction ......... 3
- CT 105 History of Costume ........................... 3
- CT 125 Draping .......................................... 3
- CT 165 Tailoring ....................................... 3
- CT 170 Flat Pattern Designing ..................... 3
- CT 185 Family Clothing ................................. 3

**Foods and Nutrition**
- FN 24 Principles of Nutrition ...................... 3
- FN 24a Laboratory for Nutrition and Food Preparation 3
- FN 25 Meal Preparation for the Family ............ 3
- FN 107 Experimental Foods ........................... 3
- FN 135 Weight Control ................................. 2
- FN 140 Nutrition ........................................ 5
- FN 141 Child Nutrition ................................. 2
- FN 146 Food Technology ............................... 2

**Family and Child Development**
- FCD 20 Preparation for Marriage and Family Relations 3
  or
- FCD 120 Marriage ......................................... 3
- FCD 67 Early Childhood ................................ 3
- FCD 68 Preschool Laboratory ....................... 2
- FCD 77 Child from 6-12 ................................ 3
- FCD 100 Human Growth and Development ............. 3
- FCD 108 Guidance of the Young Child ............. 3
- FCD 115 Growth of the Infant ....................... 3
- FCD 130 Play and Play Materials .................... 3
- FCD 185 Family in Middle and Later Years ......... 3

**Office Administration Courses**

SS 51 Intro. to Sec. Training ............................. 2
SS 42 Intro. Type ......................................... 2
SS 65 Records Administration .......................... 3
SS 92 Business Machines .................................. 2
SS 167 Office Practice ................................... 2
SS 175 Office Management ............................... 3
SS 186, 187 Secretarial Procedures .................... 6
*BA 1 Accounting ........................................... 4
**BA 20 Intro. to Business................................. 3
SS 141, 142, 143 Dictation and Transcription
  I, II, III .............................................. 15
BA 143 Business Communications ..................... 3

*It is recommended that BA 2 also be completed. 4 hours.
College of Forest, Range and Wildlife Management
College of

Forest, Range and
Wildlife Management

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- Timber Management, 169
- Forest Recreation Management, 169

Department of Range Management, 173
- General Range Management, 173
- Forest-Range Management, 174
- Watershed Management, 174

Department of Wildlife Resources, 176
- Game Management, 176
- Fishery Management, 177

Degrees Offered:
- Bachelor of Science
- Master of Forestry
- Master of Science
- Doctor of Philosophy
College of

Forest, Range and Wildlife Management

J. Whitney Floyd, 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 prepare a student for positions with federal or state agencies and for private work in (1) Forest Management, (2) Range Management and (3) Wildlife Resources. A Forest Management student may choose between three options: one designed to train for general Forest 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. A Wildlife Resources student may select a curriculum to train either for Game Management or Fishery Management.

A student will make more satisfactory progress if he has had two years of high school Algebra, Geometry, and also Chemistry, Physics, Typing and Biology. Four years of English are also desirable. An interest in and an aptitude for studying natural science is important. Mere field ability is not sufficient. A prospective student should realize that Forestry and related fields are highly technical professions. They require high aptitude for scholarship and technical development. Success also is correlated with personality and ability to deal with people.

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

**Summer Camp.** Successful completion of field instruction at the College-operated Summer Camp is required of students who plan to major in any curriculum in the Forest 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 one should be inoculated against Rocky Mountain spotted fever.

As a transfer to this College from another school a student 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 department 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 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 is charged each student to defray the transportation expenses of the trip.

**Loan Funds.** Three sources of funds are available on a loan basis to worthy, deserving upper-division students in the College of Forest, Range, and Wildlife Management. These are the W. B. Rice Memorial Loan Fund, the Turner Memorial Fund and the Bureau of Land Management Fund. Loans are made for short periods. The funds are administered by a faculty committee. 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 one's chosen field. (3) Three hours of Social Science, in addition to General Economics. (4) Proficiency in written and spoken English. If deficient in English, a student is required to pass certain supplementary or corrective courses in addition to regular requirements. (5) At least one summer of department-approved practical and qualifying work experience. In certain instances Summer Camp attendance may fulfill this requirement.
Upon completion of any of the following three programs of study, a student is granted the degree of Bachelor of Science in Forest Management. These three programs of study are designed to give comprehensive training in all branches of Forest Management, including growing, protecting, harvesting, and utilization of timber crops. It is desirable that one know by the end of his sophomore year in which of these three options to 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 in 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 a person 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 outdoor recreation organization, management, and supervision is provided, and in addition to this a student is given sufficient Forestry training to qualify for the various federal Civil Service examinations and positions.

**Honors.** Any students having an accumulative grade point average of 3.2 or better may be eligible for the honors program. A student in the department honors program may, with the approval of his major professor, substitute certain optional courses for generally required courses.

### Required Basic Courses

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<tbody>
<tr>
<td>English 1, 2, 3</td>
<td>3</td>
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<tr>
<td>Mathematics 34, 35, 441</td>
<td>3</td>
<td>5</td>
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<td>Chemistry 10, 11, 12</td>
<td>5</td>
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<tr>
<td>Forest Management 1</td>
<td>2</td>
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<tr>
<td>Range Management 1</td>
<td>1</td>
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<tr>
<td>Wildlife Resources 1</td>
<td>1</td>
<td></td>
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<tr>
<td>Animal Husbandry 1, 2^2</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Engineering Drawing 6^3</td>
<td>1</td>
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<tr>
<td>M.S., A.S., or P.E.^3</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
</tr>
</tbody>
</table>

^1 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.

^2 Not required of students taking the Timber Management option.

^3 Not required of students who have had adequate training in engineering-mechanical drawing in high school.

^4 P.E. is 1 credit; M.S. and A.S. are each 2 credits. Not required for those who have served with the armed forces.
SOPHOMORE YEAR

Course | Quarter taught and credit | F | W | S
--- | --- | --- | --- | ---
Botany 24, 25, 30 | 5 | 5 | 5 | 5
Botany 120 | 5 | 5 | 5 | 5
Civil Engineering 81 | 3 | 3 | 3 | 3
Forestry 134 | 3 | 3 | 3 | 3
Physics 6 | 5 | 5 | 5 | 5
Agronomy 58 | 5 | 5 | 5 | 5
Economics 51 | 5 | 5 | 5 | 5
Speech 105 | 3 | 3 | 3 | 3
Geology 3 | 5 | 5 | 5 | 5
M.S., A.S., or P.E.* | 1-2 | 1-2 | 1-2 | 1-2

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 | 2
Forest Management 114, 115 | 3 | 3
Forest Management 118 | 3 | 3
Forest Management 132 | 3 | 3
Forest Management 137 | 3 | 3
Forest Management 146 | 3 | 3
Range 126 | 5 | 5
Wildlife 150 | 5 | 5

SENIOR YEAR

Course | Quarter taught and credit | F | W | S
--- | --- | --- | --- | ---
Forest Management 119 | 3 | 3
Forest Management 120 | 3 | 3
Forest Management 121 | 4 | 3 | 3
Forest Management 122, 123 | 4 | 3
Forest Management 126 | 3 | 3
Forest Management 133 | 2 | 2
Forest Management 147 | 2 | 2
Range 131 | 4 | 5
Range 162 | 4 | 5
Range 180 | 4 | 5
English 111 | 3 | 3

B—TIMBER MANAGEMENT

Course | Quarter taught and credit | F | W | S
--- | --- | --- | --- | ---
Forest Management 116 | 2 | 2
Forest Management 125 | 3 | 3
Forest Management 129 | 2 | 2
Forest Management 130 | 4 | 4
Forest Management 131 | 3 | 3
Zoology 105 | 3 | 3
Botany 140 | 4 | 4

C—FOREST RECREATION MANAGEMENT

If the Forest Recreation Management is chosen, a student takes 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 | 2 | 2
Forest Management 138 | 2 | 2 | 2
Forest Management 139 | 3 | 3 | 3
Civil Engineering 120 | 4 | 4 | 4
Landscape Architecture 3 | 3 | 3 | 3

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 all of the courses in the 200 series taught in the Forest Management Department are required. One or two years may be required, depending upon whether a student can devote full or only part time to his studies. An applicant should submit an official transcript of the 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 the undergradu-

* Taken in spring quarter of freshman year.
ate work is to Forestry. For this program, application should be made 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]

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) [Resch]

96. **Forest Surveying.** Practical field problems in surveying methods commonly employed in Forest, Range, and Wildlife Management. Lab Fee $$. (Summer camp 3 credits) [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 $$$. (Summer camp 4 credits.) [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) [Kearns]

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]

110. **Principles of Conservation.** An introduction to conservation problems designed to acquaint one with the nature and extent of the renewable resources of the United States and the methods of conservatively using them. Open to all students except those registered in the College of Forest, Range, and Wildlife Management. (2W) [Box]

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 126. (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, suppression and suppression of forest and range fires, including economic and physical effect; fire behavior. Field trips. (3F) [Tocher]

119. **Forest Protection II.** Problems of administration and economics in protecting forests from biological enemies. Prerequisites: Forestry 115, 121. (3W) [Resch]

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]

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


129. Mechanical Properties. Factors affecting the strength of wood. (2W) Resch

130. Milling and Products. Manufacturing, grading, seasoning and preserving lumber, including study of the wood-using industries and their products. (4S) Resch

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) Kearns

134. Aerial Photo Interpretation. Elements of photogrammetry; use of aerial photographs in mapping vegetation types and estimating timber volumes, construction of planimetric maps from aerial photographs. (3F, W) Tocher

137. Improvements and Recreation. Recreational use of forests and the classifications and planning of areas suitable for this purpose. Field trips. (3F) Tocher

138. Recreational Land Classification. Land classifications and economics of various forms of forest recreational use. (2S) Tocher

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) Resch

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) Tocher

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

*139. Taught 1962-63.

**139. Taught 1963-64.
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 such positions as Forest Ranger, Soil Conservationist, Range Manager or Range Conservationist under the United States Civil Service Commission, with such federal agencies as the Forest Service, Soil Conservation Service, 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.** A core of basic course work as outlined below must be completed. In consultation with his adviser, a student must elect other course work to meet his personal objective in training. The adviser must approve a complete study program before the student can become 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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Minimum quarter-hour credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>9</td>
</tr>
<tr>
<td>College algebra and trigonometry</td>
<td>8</td>
</tr>
<tr>
<td>Chemistry, including organic</td>
<td>15</td>
</tr>
<tr>
<td>Botany, including taxonomy</td>
<td>15</td>
</tr>
<tr>
<td>Physics</td>
<td>4</td>
</tr>
<tr>
<td>Economics</td>
<td>5</td>
</tr>
<tr>
<td>Soils</td>
<td>5</td>
</tr>
<tr>
<td>Geology</td>
<td>5</td>
</tr>
<tr>
<td>General Zoology</td>
<td>6</td>
</tr>
</tbody>
</table>

During the junior and senior years Range majors must complete the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Minimum quarter-hour credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant ecology</td>
<td>5</td>
</tr>
<tr>
<td>Plant physiology</td>
<td>5</td>
</tr>
<tr>
<td>Range plant communities</td>
<td>10</td>
</tr>
<tr>
<td>Watershed management</td>
<td>4</td>
</tr>
<tr>
<td>General range management</td>
<td>5</td>
</tr>
<tr>
<td>General field problems</td>
<td>3</td>
</tr>
<tr>
<td>Range technical problems</td>
<td>3</td>
</tr>
<tr>
<td>Range improvement</td>
<td>3</td>
</tr>
<tr>
<td>Adv. Zoology or Wildlife</td>
<td>5</td>
</tr>
<tr>
<td>Range seminar</td>
<td>2</td>
</tr>
</tbody>
</table>

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.
To a selected few students, a program 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. 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. **Plant Community 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. Prerequisite: 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)

162. Range Management. Problems in managing native range lands; maintenance of production; utilization of range forage; and range livestock management. Prerequisite: Summer Camp. (6S) 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 dama 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) Stoddart

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, Senior classification. Three lectures, one lab. Lab fee $4. Saturday field trips may be scheduled. (4W) 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

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. (28) 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: Animal Nutrition. (3W) Cook


207. Graduate Seminar. Review of current research in range management by graduate students and faculty. (18) Box

210. Environmental Factors. Environmental factors and interaction between organisms and environment as found on native range land. Prerequisites: Plant Ecology and Plant physiology. (2F) Goodwin

211. Synecology. Development, structure analysis, and classification of native range vegetation. Prerequisite: Plant Ecology. (3W) Goodwin

280. Watershed Analysis. Advanced study of technical problems encountered in watershed management. Prerequisite: Watershed Management. (2F) 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. (28) Smith

*Taught 1962-63.
**Taught 1963-64.
Students majoring in this department may choose either of two options: Game Management or Fisheries. Each leads to the degree of Bachelor of Science in Wildlife Resources.

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

The first two years will include courses designed to give the student a sound scientific background. By the beginning of the junior year one should decide with his adviser upon a course of studies for the final two years. Besides choosing an option a student will want to select courses to meet his particular professional goal.

During the freshman and sophomore years a student should complete the following:

- English 1, 2, 3 ................................................. 9
- College algebra and trigonometry .......................... 8
- Chemistry, including organic ................................ 15
- Botany, including taxonomy .................................. 15
- Zoology: invertebrate, vertebrate and entomology ...... 15
- Physics ................................................................ 4
- Economics ................................................................ 4
- Soils ..................................................................... 5
- Survey courses in forest, range, and wildlife management 5
- M.S., A.S., or P.E. ................................................. 6

Electives from associated departments are chosen with approval of the 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; English 111, 112, 117; Journalism 112; 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 157, 158, 159, Seminar (Senior Year) .......... 3
- Wildlife 160, Animal Ecology ................................ 5
- Range 126, Plant Ecology ..................................... 5
- Applied Statistics 131, Statistical Methods ............... 4
- English (Advanced Writing) ................................... 6
- Speech 105, Technical Speaking .............................. 3
- Social Science (in addition to Economics 51) ............... 7

In addition to these courses, one of the following options may be chosen:

Option A. Game Management

Any two of the following three
- Wildlife 146, Management of Upland Game ............... 3
- Wildlife 147, Management of Waterfowl and Furbearers ......................................................... 5
- Wildlife 153, Management of Big Game ................ 5

PLUS
- Zoology (two courses in 100 series) ...................... 8

Any two of the following four
- Wildlife 161, Limnology .................................... 4
Wildlife Resources 177

Wildlife Resources Courses

1. Elements of Wildlife Management. Introduction to the problems and methods of wildlife management. (1S) Wagner

99. Wildlife Practice. Integrated studies of wildlife populations in relation to land uses. Lab. fee §5. (1 Summer Camp) Kelker


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) Kelker

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) Stokes

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) Wagner

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) Kelker

Ichthyology. Ecology, classification, and life histories of native and introduced fishes. Two lectures, two labs. (See Zoology 155 and 156.) (5W) 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

Option B. Fishery Management

Wildlife 161, Limnology ............................ 4
Wildlife 165, Fishery Management .................... 3
Wildlife 169, Techniques of Fishery Management ............................ 5
Zoology 155, Ichthyology ................................ 3
Zoology 156, Ichthyology Lab .............................. 2
Any two of the following four
Wildlife 162, Fishery Biology ............................ 4
Wildlife 166, Aquatic Ecology ............................ 3
Wildlife 172, Problem Orientation ............................ 3
Wildlife 175, Wildlife Law Enforcement ............................ 3
Total including related courses (see above) : 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 five research assistantships for graduate students in the department. The Wildlife Resources Department has one teaching assistantship. In addition there are usually several grants from outside conservation agencies available to support graduate research. A prospective student 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 Resources. Applications for assistantships should be directed to the Leader of the Wildlife or Fishery Research Units or the Head of the Department.
161. Limnology. Physical, chemical and biological factors affecting occurrence and productivity of fishes and other aquatic animals in fresh waters. Prerequisites: Botany 30, Entomology 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

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. (8S) 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


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

248. Animal Behavior. Instinct and learning in animals. Three lectures, one lab. (4F) Stokes

253. Advanced Big Game Management. Population dynamics, census methods, hunting regulations, and management plans. Prerequisite: Wildlife 153 or equivalent. Two lectures, one lab. (3W) Wagner

257. Graduate Seminar. Discussion of 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


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
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Humanities and Arts

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Degrees Offered:
  Bachelor of Science
  Master of Science
Scope of College of Humanities and Arts. Besides providing basic preparation courses for students who will graduate from other divisions of the institution, the College of Humanities and Arts assists all students in the University toward a liberal education. The need to understand our own culture and the culture of other nations has never been so urgent as now, and for this understanding, languages, philosophy, literature, and the arts are essential. These are the means by which individuals and peoples speak to each other, whether in an individual conversation, a public address, a television documentary, a story, a painting, a statue, a musical work. To know the work of Aeschylus, Plato, and Praxiteles is essential if we would know Greece, for example, and understand the significant parts of our culture which we have inherited from her.

The curricula of the College also enable a student to prepare for a career with a major in any of several departments:

English and Journalism (English, American Studies, Writing and Mass Communication, Journalism and Photography), Fine Arts (Music, Theatre Arts, Visual Arts), Landscape Architecture and Environmental Planning, Languages (and Philosophy), and Speech. For teachers, composite majors in English-Speech and Speech-Theatre Arts are offered.

Those interested in a broad education rather than a specific career preparation may take a degree in Liberal Studies. Sufficient concentration in languages, literature, history, or one of the sciences is required to provide sound preparation for graduate work, but emphasis is on a good introduction to several areas.

General 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 of environments, kinds of living things, reproduction, development, inheritance, and evolution. Five lectures. (SF, 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, Arts)

English 34, 35, 36—Great Books and Ideas.
English 40, 41—World Literature.
English 53, 54, 58—American Literature.
Philosophy 50—Beginning Logic.
Music 1—Enjoying Music.
Music 25—Orchestra.
Music 27—University Band.
Music 28—Varsity Band.
Music 33—Choir.
Theatre 1—Understanding Theatre.
Visual Arts 1—Exploring Art.
Visual Arts 10—Analyzing Contemporary Painting.
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.

Liberal Studies

Professor T. Y. Booth, Coordinator.
Office in Main 182

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.

Students who are enrolled in another department but believe that they have chosen their major unwisely may transfer to the Liberal Studies program upon receiving permission from the Office of Student Services and from the Dean of the College of Humanities and Arts.

Curricula in Liberal Studies

The following three courses of study, each leading to a Bachelor’s degree, are available in Liberal Studies. Students are not required to complete a separate minor. Because of the requirements for basic courses in several fields, upper division requirements for graduation may be reduced to a minimum of fifty credit hours.
I. Main Currents in Western Civilization. Two years of a foreign language; a concentration of forty credits in either history or literature and fifteen credits in the one not chosen for concentration; fourteen credits in Philosophy\(^1\); fifteen 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 fifteen credit requirement: any fifteen 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; History 4, 5; any two (six credits) of Political Science 145, 146, 147.

II. Languages and World Literature. Thirty-nine credits in foreign languages; forty credits in Literature; thirty 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. 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. Zoology 3, 4, 101, 107, 112, and 131; Botany 24, 25, 30, 118; Bacteriology 10, 160; Public Health 50, 155; Physiology 104. If students select this series they should fill the physical science group requirements with classes in Chemistry or Physics.

(B) History, literature, philosophy. Thirty credits from among the following, shared among at least three departments: English, American or Comparative Literature or the literature of a foreign language; Philosophy 45, 50, 140, 141,

\(^1\)See Philosophy Division of Department of Languages. Political Science 145, 146 and 147 deal with political philosophies and are therefore relevant.

\(^2\)Ten of these credits may be applied toward the group requirement in the field.
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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. Students may be admitted on the recommendation of their department head, or upon direct application to one of the instructors. The courses will ordinarily be taught by two or more instructors from different academic fields. The aim is to give superior upper-division students from several departments opportunity to read, discuss, and write about significant facts and ideas, approached from a broader point of view than is ordinarily possible in advanced departmental work.

111. Perspectives of Contemporary Thought. 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

Students are encouraged to broaden their liberal education with other courses in basic Sciences and Humanities, Art, Music, Landscape Architecture, Political Science, Economics, and Sociology.

Department of

English and Journalism

(English, Journalism, Writing and Mass Communications, American Studies, Photography)


English Office in Library 320
Journalism Office in Information Service Building
Photography Office in TG Building

The need for teachers of English grows more critical each year at all levels.

There are five different majors available in the English and Journalism Department:
(1) A Standard English major.
(2) An English Teaching major.
(3) An American Studies major.
(4) A Writing and Mass Communications major.
(5) A Journalism and Photography major.

The Standard English Major. Students may complete the Standard English Major and the necessary requirements for certification during the four years. This will qualify them for either graduate work or secondary teaching.

In the standard English major, the student should take courses specified in the eight areas below:

(1) Lower Division (minimum fifteen hours): 40, 41, 53, 54, 60, 61.

(2) Early English (minimum fifteen hours): 162, 166, 175, 180.

(3) Late English (minimum five hours): 190, 191.

(4) American Literature (minimum nine hours): 150, 151, 152, 153, 155, 156, 157, 158.

(5) World Literature (minimum five hours): 140, 141, 147, 148, 149.

(6) Types (maximum twelve hours): 137, 163, 164, 168, 169.

(7) Technical (maximum six hours): 104, 112, 117a, 117b, 117c, 134.

(8) Language (minimum 24 hours, two years): French, German, Spanish, Latin.

With the consent of his adviser the student may select other courses to meet the requirements in areas 6 and 7.

He will be expected to complete between 45 and 50 total hours in addition to the Language courses and the Basic Communications course, which is required of all freshmen and other students who have not had its equivalent.

This four-year course may qualify the student for admission into the School of Graduate Studies.

English Teaching Minor. In addition to the Basic Communications and Language Arts group requirements, the student should complete a minimum of 25 hours in English, as follows:

(1) English 60, 61 (ten hours).
(2) English 150, 151, 152 (nine hours).
(3) English 104 (three hours).
(4) English 112 or 117b (three hours).

Any deviation from this plan must have the approval of the head of the English department.

A prospective English teaching minor should meet with the head of the English Department to have the course approved.

The American Studies Major. An American Studies major combines courses with those from the College of Business and Social Sciences. The requirements are as follows:

(1) Complete a minimum of 36 hours in English, American, and World Literature from the following or other approved courses: 40, 41, 46, 53, 54, 58, 60, 61, 147, 150, 151, 152, 153, 154, 155, 157, 158, 159.

(2) A minimum of sixteen hours in History, preferably 13, 14, 156, 157, 158.

(3) A minimum of eleven hours in Political Science, preferably 10, 106, 117, 118, 119.

(4) A minimum of six hours in the following areas: Economics, Sociology, Art, Music, and Education.
(5) A minimum of 24 hours—two years—in a Language: French, German, Spanish or Latin.

An American Studies major is not required to complete a minor. He should contact Dr. Hubert W. Smith to have his course approved.

The Writing and Mass Communications Major. For a career as a creative writer, journalist, technical writer, public relations counselor, or mass communications expert, a student plans a two-fold course as follows:

(1) Complete a minimum of thirty hours in addition to Basic Communication or its equivalent, from such writing courses as Journalism 12, 13, 14, 112, 84, 184, 185, 186, 187 and English 12a, 12b, 111, 112, 117a, 117b, 117c, 199.

Suggested additional courses are Fine Arts 160; Speech 81, 125; English 5, 104; Philosophy 45, 50, 140, 141, 142, 160.

(2) Complete a minimum of 30 hours from the following courses offered by the English Department: 33, 34, 35, 36, 37, 40, 41, 42, 46, 48, 53, 54, 58, 60, 61, 68, 137, 140, 147, 148, 149, 150, 151, 152, 154, 158, 163, 164, 165, 168, 169, 170, 190, 191.

(3) Two years of foreign language.

The student should plan to take at least one writing course each quarter. No minor is required.

Journalism and Photography Major. A major in Journalism and Photography requires completion of Journalism 1, 2, 3, 12, 13, 14, 84, 106, 112, 125, 164, 184; Photography 51, 61, 151, 161; Speech 81, 82, 83, 181; English 5, 111, 117a and b, and at least twenty credits in English and American Literature. Students 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. See Professor John J. Stewart. For details of a Photography minor, see Mr. Arlen Hansen, TG Building.

Graduate Study

Master of Science Degree. The candidate for a Master of Science degree in English must present a Bachelor's degree with English as a major, or an equivalent. To complete the degree he 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 proficiency in 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. Candidates for the Master's degree in American Studies are required to present a Bachelor's degree with American Studies, English, History, or Political Science as a major. The course of study will be arranged in consultation with any member of the American Studies committee and is subject to approval by the chairman of the committee, Dr. Hubert W. Smith. The emphasis in graduate
work will be largely governed by (a) the candidate's cultural and professional objectives and (b) his undergraduate course work.

Total credit and examination requirements are in general the same as those for the Master's degree in English. However, the departmental qualifying examination will be administered by the American Studies committee and will cover primarily American Literature, American History and American Political Institutions.

A selection of the following courses may be applied toward satisfying requirements for the Master's degree in American Studies: English 150, 151, 152, 153, 154, 155, 156, 157, 158, 201, 252, and 253; History 143, 144, 152, 156, 157, 158, 171, 203, and 224; Political Science 101, 117, 118, 119, 125, 127, 140, 160, 180, 201, 207, 208, and 209.

As many as ten credits may also be drawn from upper division courses in the following subject matter fields: English and Comparative Literature, English and World History, Philosophy, Art, Music, Sociology and Economics.

In either program (English or American Studies) the candidate may elect an alternate plan which requires a minimum of 45 credit hours of which at least twenty must be in courses numbered above 200 (202 a, b, c cannot be counted as part of the twenty). All other requirements are the same.

Assistantships. Some assistantships are available for students who qualify as Master's candidates in the English department. If a student is interested in one of these assistantships he should make formal application to the Head of the English Department.
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58. Modern American Literature. (3F) Taylor

60. English Literature, Early Period. (5F, W, S) Skabelund

61. English Literature, Late Period. (5F, W, S) Skabelund

68. Modern English Literature. (3W) Bullen

104. Grammar. Designed for teachers. (3S) Mortensen

111. Technical Writing. Effective communication of ideas via the technical report and the scientific article. 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.) (5F, W, S) Freitzeche, Axelrad

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. (5F, W, S) Mortensen

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. (5F, 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) Patrick

137. English Novel. The English novel in the 18th and 19th centuries. (3S) Bullen

140. Greek Literature. The literature of Greece. (5F) Stock

141. Roman Literature. Roman literature in the 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) Smith, Taylor

151. American Fiction. Nineteenth and early Twentieth Century fiction writers. (3W) Smith, Taylor

152. American Drama. Historical treatment of American drama: extensive reading of representative plays. (3S) Smith

153. Western American Literature. Literature of the trans-Mississippi West, from the early explorers through the period of settlement. Background material from early journals and official records will be examined. The principal emphasis of the course will be on the novels and short stories depicting the explorers, mountain men, miners, cattlemen, and homesteaders. (3S) Staff

154. Readings in Individual American Authors. Each course in this series involves a comprehensive reading of one author and a high level understanding of his content and style. There is no prerequisite. (a) Thoreau, (b) Whitman, (c) Twain, (d) O'Neill, (e) Faulkner, (f) Hemingway. (3S) 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


157. The American Literary Renaissance. The rise of social, political, philosophical, and religious liberalism and idealism as reflected by authors from Irving to Whitman, with special emphasis on the transcendentalist movement. (3) Smith

158. Realism and Modernism in American Literature. The turn late in the nineteenth century to realism and naturalism in the works of Twain, Howells, James, Crane, Norris, Garland, and Dreiser. Twentieth century literature as a reflection of social, economic, and political issues growing out of America's industrialization and role of world dominance. (3) Smith

159. Critical Studies of Individual American Authors. Each course is an intensive study of the major works of one author with special concern given to matters of text, bibliography, and significant critical writings about the
205. Anglo-Saxon. Required of all candidates for the Master's degree. (5W) Hendricks

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) Axelrad, Taylor, Frietzschke

234. Seminar in Modern Criticism. (3F) Patrick

251. Seminar: Early American Literature. (a) The Puritan Mind, (b) The impact of Deism, (c) Democracy and Religious Diversity. (3) Staff

252. Seminar: 19th Century American Literature. (a) The New England Circle, (b) Romanticism and Regionalism: Mid-Atlantic, South, Frontier, (c) The Rise of Realism and Naturalism. (3) Staff

253. Seminar: 20th Century American Literature. (a) Modern Poetic and Critical Schools, (b) Modern Fiction and Drama, (c) Influences of Modern Science and Philosophy. (3) Staff

261. Reading of Middle English. (3) Hendricks

265. Seminar in English Authors. (a) Bacon, (b) Spenser, (c) Marlowe and Jonson. (3) Staff

275. Seminar in English Literature 1580-1685. (3) Frietzschke

280. Seminar in Eighteenth Century Literature. (3) Hendricks

290. Seminar in Late English Literature. (a) Romantic Period, (b) Victorian Period, (c) The 20th Century. (3) Staff

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. May be repeated once for credit. (1F, 1W, 1S) Stewart

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
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14. Reporting and Copyediting. Advanced reporting assignments. Laboratory exercises in editing copy, writing headlines, makeup. Prerequisites: Journ. 12, 13. (5S) 

*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 information 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) 

*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, 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: Photography 51. Two lectures, lab arranged. Credit arranged. Maximum of 6 credits per quarter. (F, W, S) 

Hansen

161. Advanced Photography Lab. (2F, W, S) 

Hansen

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: Photography 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: Photography 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: Photography 51. Two lectures, one three-hour lab. (3F) 

Hansen

*Taught 1962-63.

**Taught 1963-64.
Department of Fine Arts

(Music, Theatre Arts, Visual Arts)

Professors Twain Tippett, Head, Floyd T. Morgan, H. Reuben Reynolds, Walter Wett; Associate Professors Max F. Dalby, Alma L. Dittmer, Harrison T. Groutage, Jessie Larson, Everett Thorpe, Irving Wassermann; Assistant Professors W. Vosco Call, Nancy Gade, Gaell Lindstrom, Ronald Stoffel, Alvin Wardle; Instructors Larry Elsner, Fay Hanson, George Pahtz.

Office in Main 328

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 students 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 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—21 hours: Music 4, 5, 6, 104, 105, 106; (2) Music History and Literature—9 hours: Music 101, 102, 103; (3) Music Education—15 hours: Music 140, 141, 150, 151, 153; (4) Applied Music—A music education major 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 24, 124, 25, 125, 27, 127, 28, 128, 33, 133, 36, 42, 142, 43, 143, 44, 45, 46, 135, 137, 138, 139. (May be repeated under same numbers.)

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 112 are required; (3) Majors in Piano are required to take 180, 181, 182; if an instrumental major, 185, 186; if a Vocal major, 183, and 184.
A program of individual study will be outlined by the major professor; students shall give an individual graduation recital, preferably in their 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 one 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 the 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, students may be required to 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 the 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. Students may elect additional credit from the following:

Aesthetics; Music 201, 3 hours; Music 205, credit arranged; Music 243, 1 hour, and any upper division courses recommended by the advisor.

Students 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) Students need not have a teaching knowledge of all instruments and voice in order to specialize vocally or instrumentally; (2) the counseling examination does not include the area of Music Education; (3) the Music Education Seminar is recommended, but not required; (4) students 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. Other elective courses most helpful to the individual situation are encouraged.

Music Courses

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


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) Staff 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

42. 142. Piano Ensemble. 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, Stoffel

44. Brass Ensemble. Brass quartets, sextets, and larger groups. Members are selected from applicants. (1F, 1W, 1S) Hanson, 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

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. Hanson, Wardle

74. 174. Individual Violin and Viola Instruction. Stoffel

75. 175. Individual Cello Instruction. Pahtz

80. Group Piano Instruction. (1F, 1W, 1S) Staff

81. Group Vocal Instruction. (1F, 1W, 1S) Dittmer, Welti

82. Group Woodwind Instruction. (1F, 1W, 1S) Dalby

83. Group Brass Instruction. (1F, 1W, 1S) Hanson, Wardle

84. Group String Instruction. (1F, 1W, 1S) Staff Stoffel

101, 102, 103. Music History and Literature. Basic course for music majors and those desiring a comprehensive background in music. Stresses music in general culture; the place of music in history, and the relationship of music to the other arts. Fall quarter covers the period from antiquity through the Baroque; winter quarter covers through Romanticism; spring quarter through contemporary music. Required of all music majors and minors. Music 1, recommended prerequisite. Credit arranged. (3F, 3W, 3S) Wassermann


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. (8W) Dalby

111. Composition. Projects in creative composition for more advanced students. Prerequisites 106 and 107. (3S) Staff

112. 20th Century Music. An intensive survey of the significant techniques, forms, and styles in the music of our time. Analysis of a variety of scores and recordings. Works of criticism evaluating recent development and form and statements by composers discussing their philosophy and aims are studied. (3Su) Staff

124. Chamber Orchestra. The preparation and performance of music for chamber orchestra and theatre. To serve regularly in conjunction with the spring musical and programs devoted to the 18th century repertoire. Staff

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

Fine Arts 193
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)

140. Choral Conducting. Basic routines of organizing and training choruses. Assigned projects in conducting small and large local ensembles. (3F) Welti

141. Instrumental Conducting. Basic routines in dealing with instruments in ensembles, band, and orchestra. (3W) Welti

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

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 as studied by listening to recordings of great opera literature. (2W) Stoffel

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. (3S) 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

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 17-29 (1Su) Staff

221b. Brass Clinic. An intensive study of the brass instruments with recommended methods of teaching. Daily June 17-29 (1Su) Staff

242. Chamber Music Interpretation. An intensive study of chamber music styles and the varied problems of this interpretation. Emphasis will also be placed on actual performance. Students will also receive training in the coaching of beginning and intermediate ensembles. (1S, Su) 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 choir. Daily June 17-29 (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, June 17-29 (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, June 17-29 (1Su) Staff

258. Seminar in Music Education. Teaching and administration of various phases of the music program. Special projects. (3S) Dalby

259. Seminar in Music Theory. A study of the practical aspects of musical theory as related to analysis, pedagogy and composition. (3F) Dittmer
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

Individual Recital. This course is designed for the preparation and presentation of an individual recital on any instrument or voice prescribed and supervised by the major professor. (3F, 3W, 3S) Staff

The undergraduate curriculum and Utah State Theatre activities are designed to help students prepare for a teaching career in Theatre Arts or to prepare for advanced study.

Sixty-one credit hours of work in Theatre Arts and Speech are required for the non-teaching major in Theatre Arts and fifty-one credit hours for the teaching major. A detailed list of requirements may be obtained from the department office. If one desires to complete a composite major in Theatre Arts and another division or department, English, Speech, Music, or Visual Arts, he should arrange his program with the advisors assigned to him by the heads of the departments concerned.

For a minor in Theatre Arts a minimum of eighteen credit hours is required. For the teaching minor in Theatre Arts twenty to twenty-four credit hours are required. A detailed list of requirements may be obtained from the minor adviser. All majors and minors should register for FA-TH 1 in the first quarter of study.

The Utah State Theatre produces a number of plays each year. A major or minor in Theatre Arts is required to participate in every production by acting, or assisting in the staging, lighting and managing of the various dramatic presentations. The advisor will rotate these experiences so that one obtains a variety of opportunities.

Graduate Study

Theatre Arts offers advanced course work and seminars leading to the Master of Science degree with a major in Theatre Arts. During the first quarter of residence, and before admission to candidacy for the Master of Science degree, one takes two diagnostic or program planning examinations. The first of these is a comprehensive written examination covering history and literature, directing, technical theatre, and criticism and current theatre. The second is an oral skills test in which a student demonstrates before a departmental committee his competency in voice and diction, extemporaneous speaking and interpretative reading or acting. The results of these diagnostic inquiries are used to assist him and his 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 one may, with the approval of his supervisory committee, elect to write a thesis or he may present a creative project in playwriting, directing, acting, scene or costume designing or technical practice. As part of the creative project and in lieu of a thesis, he submits a manuscript, production book or project record.

Theatre Arts Courses

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, 3W, 3S) Staff

May be used to help fill the language and arts group requirement.
12. 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


Call

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


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


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

56. Puppetry. The design, construction, and manipulation of puppets. Recommended particularly for elementary teachers. (3W)

Reynolds


Staff

3May be used to help fill the language and arts group requirement

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

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

**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 nonrealistic, historical, and modern plays. Relationship of costume to character and production. Prerequisites: FA-TH, or consent of instructor. (3S)

Gade

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. (2)

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

160. Playwriting. Analysis of dramatic structure as it relates to play directing, dramatic literature and the writing of dramas. (3)

Morgan

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

**Taught 1963-64
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. Credit arranged. (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. (3S) Staff

196. Advanced Directing. Practice in stage direction. The student selects, casts, directs, and presents short plays and scenes. Prerequisite: FA-TH 146. (3S) Staff

200. Seminar in Drama. Intensive study of special problems in drama and theatre. 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

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 Language and Arts group requirements. These classes are: Visual Arts 1, 10, and 2, 3, 4.

Major Requirements: Students may specialize in any of ten 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.

Minor Requirements: The requirements for a minor in art are flexible and can be completed in any of the ten major areas of specialization with the approval of the major professor. A minor in general art may include the following: FA-A 1, 2 and 3 or 4, 5, 8, 14 and three hours credit chosen from the crafts. Exceptions can be made in this series with the approval of the major and minor professors.

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 for a professional job in this field, one must acquire proficiency in lettering, design, rendering techniques and production methods. He also prepares a portfolio of work to show prospective employers his ability to produce tasteful and imaginative solutions to advertising 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.

Art Education. To teach art in the secondary schools individuals should major in Art Education. Prospective teachers are encouraged to acquire an extensive back-
College of Humanities and Arts

ground 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, 135, 152, plus additional classes prescribed by the 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, etc. and is used in the forming of many porcelain parts in technical and electronic equipment. Ceramic crafts as taught at USU are rapidly becoming an important part of artistic training recognized by both the artist and industry. The University has one of the most complete and well equipped ceramic workshops in the nation. Excellent tools and equipment are provided for each student. The lab is accessible during the day for classes and special work and two evenings per week. Special high-fire kilns are available for student work as well as a variety of clays and glazes. Programs in this area are tailored to fit needs of an individual student, both beginning and advanced. In addition to the basic 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 the major professor.

Fabric Design: Through the ages man has employed fabrics for dual purposes of utility and esthetic expression. In today's living fabrics are achieving an increasing importance and their traditional uses in personal adornment and home furnishing are expanding. Fabrics have become essential units in contemporary architectural and industrial design. New commercial products constantly suggest new areas of interest for the weaver and fabric designer. Students develop creative fabric design projects which include experimentation with new fibers and techniques of enrichment, both applied and structural, and give fresh and original application of known and satisfactorily proven techniques. In addition to the basic core of art courses, fabric design majors are required to complete the following: Visual Arts 40, 66, 115, 116, and C&T 24. Additional prescribed classes to be selected on consultation with advisers are Visual Arts 135, 140, 142, 143.

Interior 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 home appropriate to their kind of family life as well as to prepare adequately those who wish to enter the Interior Design field professionally. In addition to the basic nine courses, Interior Design Majors are required to take the following: Visual Arts 40, 66, 115, 116, 135, 140, 142, 143, 144; C&T 33. Additional prescribed classes to be selected on consultation with advisers are: Visual Arts 19, 21, 30, 60, 111, 121, 125, 166; LA 3; C&T 24, BA 63; Horticulture 118; H.A. 65; I.E. 74.

Jewelry and Metalsmithing: Various metals provide exciting possi-
ilities 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 individual needs as prescribed by the major professor.

Painting and Drawing: When most people think of art, it is painting and drawing that they generally have in mind. Contemporary artists are utilizing all of the historical approaches to painting and drawing and are exploring new ideas, techniques, and materials in order to make new contributions. A student is not required to follow any one approach to drawing or painting but his own individuality is encouraged. In addition to the basic nine he is required to take: Visual Arts 9, 104, 105, 109, 111, 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 27, 28, 29, 105, 121, 135. 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 interesting art in that it encompasses so many of the other art activities. To make a fine print a student must draw, design, carve, and print. In addition to the nine basic courses Printmaking majors are required to take: Visual Arts 9, 25, 26, 30, 40, 104, 109, 111, 127. 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 the major professor.

Graduate Study

Visual Arts offer an opportunity for research and graduate study

To become a candidate for the Master's degree: (1) Pass the qualifying examination given in the School of Graduate Studies. (2) Present a portfolio of art work to the Visual Arts Staff for its consideration. The art faculty will determine whether it 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) Select, with one of the department heads and a graduate committee, a study program and a thesis project. (4) Take a minimum of 30 hours in residence. (5) Complete within six years the requirements 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. The graduate committee shall determine whether all or what portion of nine hours will be accepted. (6) Take at least 45 hours of credit in courses numbered 100 or above which are approved for graduate credit. (7) Complete at least ten credits in the 200 category, exclusive of thesis project, for which a maximum of nine credits can be received. The thesis project is selected and approved during the first quarter. (8) Register for no more than three hours of thesis credit per quarter. (9) Keep a written and illustrated record of the progress on the thesis project. (10) Pass an oral examination on this thesis project. (11) Prepare three final copies of the written and illustrated thesis project. One is for the University library, one remains in the Fine Arts Department, the other is returned to the student. (12) Design at the time of graduation, a comprehensive exhibit of all graduate work. The thesis project should be an important part of the display.

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 spatial volume with points, lines, planes and color, and shapes with color and texture. Also sculptural experience with handles, stables, 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 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 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 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.** Techniques and methods of constructing posters. Useful for education majors. (3) Staff

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) Larson

40. **Essentials in Interior Design.** Study of historic styles; analysis of art elements; principles of design applied to home planning and furnishing. (3F, 3W, 3S) Larson

50. **Art for Young Children.** For child development majors, mothers, kindergarten and first grade teachers. (3F) Larson

60. **Beginning Sculpture.** Creative expression in a variety of plastic media. Emphasizes aesthetic employment of form and technique in plaster, clay, wood, metal, and stone. (3F, 3W, 3S) Elsner

66. **Creative Handweaving.** Introduction to basic elements and procedures of handweaving, providing a foundation for the creation of original design projects—place mats, rugs, wall hangings, room dividers, etc. (F, W, S 3-5) Larson

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) Thorpe

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 with emphasis on the literal representation of form. Various ages and racial types are studied. 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. (3S) 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. Prerequisite: FA-A 19. (3S) Staff

*Taught 1962-63.
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 prerequises: FA-A 5, 6, 7, 21, 22. (3W, 3S) Groutage

122. Advertising Design and Illustration Workshop. Advanced advertising with emphasis on designing and executing 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, 32. (3F, 3W, 3S) Staff

132. Ceramic Workshop. Advanced work in area 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) Larson

142. Interior Design Workshop. A laboratory course devoted to such activities as the designing and constructing of two and three dimensional models, interiors, elevations and decorative details—traditional and contemporary, public and domestic. To be taken in conjunction with or following FA-A 140. (3W) Larson

143. Advanced Problems in Interior Design. Experimental projects in home planning and furnishing. Prerequisites: FA-A 40, 140. (3S) Staff

144. Interior Design Apprenticeship. A course designed to acquaint students who are planning to enter interior designing professionally, to actual business procedures as practiced by reputable well-trained interior designers who have been approved by USU Fine Arts Staff. (Su and Sp 1-3) Larson

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. (3W) Reynolds

166. Advanced Fabric Design in Weaving. Special projects in applying original designs to creative weaving of tapestries, rugs and dramatic textiles. Prerequisites: FA-A 5 and 66 or equivalent. (3 to 5 F, W, S) Larson

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

*Taught 1962-63.
Landscape Architecture and Environmental Planning

PROFESSOR Laval S. Morris, HEAD; INSTRUCTORS Richard Brillantine, A. Craig Tocher.

Office in Main 34

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 major in Landscape Architecture and Environmental Planning, the following courses 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

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SOPHOMORE YEAR

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<th>Course</th>
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<tr>
<td>Plant materials, L.A. 40, 41, 42</td>
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<tr>
<td>Architectural Design 60, 61, 62</td>
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<tr>
<td>Physical Science 31, 32, 33</td>
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<td>Plane Surveying, C.E. 81, 89</td>
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<td>Sociology 79</td>
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<td>Soils, Agronomy 56</td>
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<td>Planting Design, L.A. 150, 151, 152</td>
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<td>City and Regional Planning 170</td>
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<td>Fundamentals of Speech, Sp. 1</td>
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<td>English Composition</td>
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<td>Economics 51, or Ag. Econ. 53</td>
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<tr>
<td>Cost Est. C.E. 130</td>
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SENIOR YEAR

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<td>Advanced Planning and Design, L.A. 180, 181, 182</td>
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<td>Sculpturing, Art 160</td>
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<td>Seminar, L.A. 195</td>
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<td>Writing Feature Articles, Journalism 112</td>
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<td>Roads and Pavements, C.E. 120</td>
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<tr>
<td>Technical Writing, English 111</td>
<td>3</td>
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<tr>
<td>Electives</td>
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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, W, S) Morris

30. History and Literature of Landscape Architecture. 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) Staff

40, 41, 42. Plant Materials. The ecological, functional and aesthetic uses of native and cultivated wood and herbaceous plants for use on the land. Prerequisites: Botany 24, 30, (3F, 3W, 3S) Brillantine

60, 61, 62. Architectural Design. The design, construction, and orientation of architectural structures as related to land areas. Prerequisites: L.A. 20, 35. (3F, 3W, 3S) Staff

100. Professional Experience. Prior to graduation all landscape architectural students must have completed three months’ experience in a landscape architectural position with a governmental or private organization concerned with landscape architecture. Evidence of work done and an oral or written report at the discretion of the department are required. No credit. (Su) Staff

130. Park and Recreational Planning. Analysis and development procedures in national, state, urban parks, forest lands, and private lands in terms of recreational and aesthetic values and uses. (3W) Staff

135. Travel Course. A major field trip to examine a variety of projects in planning and design. Students are required to take this course at least twice during their training. Credit arranged. (Su) Staff

140, 141, 142. Landscape 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. Pietorial compositions and planting plans developed together. Designed to develop your ability to visualize the finished landscape. (3F, 3W, 3S) Brillantine

160, 161, 162. Landscape 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) Staff

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. 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. Credit arranged. (F, W, S) Staff
Department of
Languages
(Languages and Philosophy)


Office in Main 360

Languages: Courses are offered leading to the bachelor's degree with a major in French, German, or Spanish. Selected upper division courses may also be used to fulfill graduate degree requirements. Courses are also available in Russian, Portuguese, Latin, Philosophy, and in English as a foreign language.

Elementary language courses emphasize mastery of the system of sounds and structures that are inherent in the language. Conversational and reading skills are stressed at the intermediate level, and cultural and literary knowledge in the advanced courses. The program leads either to the teaching of languages at the secondary level or to graduate school programs in language and literature.

The major requires thirty units of approved upper division work in the language of the major plus at least one year of work in another modern language or in Latin.

A minor, for the purposes of secondary school teaching, consists of fifteen units of approved upper division work including 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 fifteen hours of lower division credit in that language by special examination. Students desiring such credit must, however, first complete successfully at least one approved 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, Spanish, Italian, Portuguese, German, Dutch, Danish, Swedish, Norwegian, Russian, Polish, Serbo-croatian, and Czech.

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.

Note: Students who have had two years of high school study in a foreign language should register in intermediate courses. They 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 register for upper division work. They may not receive credit for any lower division work in the same language.

Summer School Programs

For two successive years USU has conducted a National Defense Education Act Institute for teachers of French and Spanish. Another such Institute has been approved for the summer of 1962.

Steps have also been taken to offer the equivalent of a full year in a beginning language in the ten-week Summer sessions, making it possible thus for successful students to enter intermediate language courses in the fall of the same year.

French Lower Division

1. 2. 3. Elementary French. (5F, 5W, 5S) Benson, Ingold
4. 5. 6. Intermediate French. Aural-oral approach with knowledge of structure development through pattern drills, conversation and composition. (3F, 3W, 3S) 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. An intensive course designed for graduate degree candidates who must present a reading proficiency in French and who have had little previous instruction. Reading skills will be emphasized. Prerequisite: approval of Department Chairman. (3Su, 3Su) Staff
104. Advanced Grammar and Composition. (3F) Fogelberg
113. Applied Linguistics for Teacher Candidates. Phonology, linguistic analysis and principles of language learning as applied to French. (3F) Fife
133. Romanticism in France. Chateaubriand, Hugo, Vigny, Musset, Lamartine. (2F) Staff
134. The 18th Century Philosophers and Moralists. Montesquieu, Voltaire, Diderot, Rousseau, Bernardin de Saint-Pierre, Prevost. (2W) Fife
138. The 18th Century Theatre. Comedies of Beaumarchais and Marivaux (2F) Fife
139. The Comedies of Molière. (3F) Fife
140. The Classical Tragedy. Conneille and Racine. (3S) Staff
141. Philosophers, Moralists, and Critics of the Classical Age. Decartes, Pascal, Boileau, La Fontaine. (2S) Staff
142. French Literature of the 16th Century. Rabelais, Ronsard, Montaigne. (2W) Fife
143. French Literature in the Middle Ages. Lyric, epic, and didactic literature; the theater and romances; introduction to Old French. (2) Staff

German Lower Division

1. 2. 3. Elementary German. (5F, 5W, 5S) Staff
4. 5. 6. Intermediate German. (3F, 3W, 3S) Scherer, Mussier
4a. 5a. 6a. Second-Year Conversation. Accompanies German 4, 5, and 6. Required of German majors, recommended for all students in second-year German. (2F, 2W, 2S) Scherer, Mussier
7. Scientific German. An introduction to the reading of technical German. Readings in German in various scientific fields. Prerequisites: German 4 and 5. May replace German 6 for science majors. (2S) Taught only on sufficient demand. Beyers

Upper Division

105. Advanced Composition and Conversation. (3F) Scherer
112. Applied Linguistics for Teacher Candidates. Phonology, linguistic analysis and principles of language learning as applied to German. (3W) Scherer
120. Nineteenth Century Novelle. Reading and discussion of representative stories by Hauff, Storm, Meyer, Keller, and others. (3F, 3W, 3S) M. Scherer
121. Lessing, Plays and Biography. (3S) H. Mussier
122. Schiller, Poetry, Plays and Biography. (3S) H. Mussier
123. Twentieth Century Novelle. Representative stories by Schnitzler, Mann, Hesse, and others. (3W) M. Scherer
125. Survey of German Literature. The Middle Ages. (3F) H. Mussier
126. Survey of German Literature. The 18th Century. (3W) H. Beyers
127. Survey of German Literature. The 19th Century. (3S) M. Scherer
129. Goethe's Dramas. A study of Goethe's dramas other than Faust—Goetz von Berlichingen, Ermont, Tasso, and Iphigenia. (3S) Staff
130. Goethe's Faust. Prerequisite: Two years of college German or equivalent. (3W) H. Mussier
131. Goethe's Prose. Werther, Dichtung un Wahrschein, and selections from Wilhelm Meister. Reading of a biography of Goethe. (3S) Staff
133. Drama of the Nineteenth Century. Rapid reading and discussion of representative plays from Kleist to Hauptmann. (3W) H. Mussier
134. German Lyric Poetry. A study of the major poets of Germany from the earliest times to the present. (3F) Staff
150. Modern German Authors. (A) Thomas Mann. (B) Gerhart Hauptmann. (C) Hermann Hesse. (D) R. M. Rilke. (E) Franz Kafka. (2S) H. Beyers
199. Readings and Conference. Readings in technical, scientific, and literary German. Credit arranged. Not more than 5 units total may be earned by any student. (F, W, S) Staff

Greek
1. 2. 3. Elementary Greek. (5F, 5W, 5S) (Taught only on sufficient demand.) H. Mussier

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. H. Mussier
4. 5. 6. Intermediate Latin. Readings from the orations of Cicero and Virgil's Aeneid. Miscellaneous readings from other Roman authors. Open to students who have had one year of college Latin or two years of high school Latin. (3F, 3W, 3S) (Taught only on sufficient demand.) H. Mussier

Portuguese
1. 2. 3. Elementary Portuguese. Grammar, dictation, conversation and reading. (5F, 5W, 3S) (Taught only on sufficient demand.) W. Porter
4. 5. 6. Intermediate Portuguese. Grammar, reading, conversation, composition. (3F, 3W, 3S) (Taught only on sufficient demand.) W. Porter
199. Readings and Conference. Readings in scientific, technical, or literary Portuguese. Credit arranged. Not more than 5 units total may be earned by any student. (F, W, S) W. Porter

Russian
1. 2. 3. Elementary Russian. (5F, 5W, 5S) Suprunowicz
4. 5. 6. Intermediate Russian. Second-year reading and grammar review. (3F, 3W, 3S) Suprunowicz
4a. 5a, 6a. Second-Year Conversation. Accompanies Russian 4, 5, and 6. Required for a Teaching Minor in Russian, recommended for all students in Second-year Russian. (2F, 2W, 2S) Suprunowicz
199. Readings and Conference. Readings in technical, scientific, or literary Russian. Credit arranged. Not more than 5 units total may be earned by any student. (F, W, S) Suprunowicz

Spanish
Lower Division
1. 2. 3. Elementary Spanish. (5F, 5W, 5S) Staff
4. 5. 6. Intermediate Spanish. (3F, 3W, 3S) A. Fogelberg, Reese
4a. 5a, 6a. Second-Year Conversation. Accompanies Spanish 4, 5, and 6. Required for Spanish majors and strongly advised for all teaching minors. (2F, 2W, 2S) A. Fogelberg, Reese
Upper Division

105. Advanced Composition and Conversation. (3W) Fogelberg

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. (3F, 3W, 3S) 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

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

199. Readings and Conference. Readings in scientific, technical, or literary Spanish. Credit arranged. Not more than 5 units total may be earned by any student. (F, W, S) Staff

Philosophy

Before registering for upper division Philosophy the student should already have completed ten credits in related subjects in the Humanities: Literature, History, Political Science, or Sociology.

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) Beyer

140. History of Ancient Philosophy. The development of philosophical thought in the ancient Greek world. Emphasizes reading from the Pre-Socrates, Plato, Aristotle, the Stoics, and Epicureans. (3F) Beyer

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, Leibnitz, Locke, Berkeley, Hume, and Kant. (3W) Beyer

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) Beyer

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) Beyer

English for Foreign Students

30. English Phonetics for Foreign Students. To train in the sounds of English, and to increase ability to speak with the rhythm and intonation of American English. May be taken in conjunction with Language 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

Philosophical Literature

The following courses are cited 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.

Students may take advantage of the instruction in religious philosophy offered by churches in Logan. Of such courses, those classed as non-sectarian yield University credit.

Philosophical Literature Courses

English 48. Modern European Literature. (See English Department.)

English 58. Modern American Literature. (See English Department.)

English 68. Modern English Literature. (See English Department.)


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. Students 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 3 and 4. (3W) Gardner

English 134. Literary Criticism. (See English Department.)

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 Speech

PROFESSORS Rex E. Robinson, HEAD, Chester J. Myers; ASSOCIATE PROFESSORS Burrell F. Hansen, Gwendella Thornley; INSTRUCTOR Janet Stock.

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, the speech major is required during his junior and senior years to obtain one year's broadcast experience at a commercial or educational television or radio station.

If he is emphasizing clinical speech and desires to comply with minimum standards for certification he 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 he is exempt from the Theatre Arts requirement and one half of the Radio and Television requirement.

A composite English-Speech major requires 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.

A composite Speech-Theatre Arts major requires 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


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 works 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 developing appreciation in selection of programs. (3F) Hansen

82. Radio-TV Speech. Analysis and development of speech skills and speech forms used in radio and TV. Development of acceptable standards of voice articulation and pronunciation for broadcasting. (3W) Hansen

83. Radio Production. The production of radio commercials, news, musical programs, interviews, discussions and dramas. To be taken concurrently with Journalism 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 three 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, 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


*Taught 1962-63.
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)
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
115. Intercollegiate Debating. Members of debating squads may receive not more than three credits in any one year. (3F, W, S) Robinson
122. Reading Poetry to Children. The study and application of oral reading principles as applied directly to children's poetry. Also a consideration of choral reading techniques applicable to classroom situations and programming. Designed especially for teachers, prospective teachers, librarians and parents. (2S) Thornley
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
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. (3S) Staff
172. Methods in Speech Correction. Instruction is given in appropriate and effective methods of correcting speech defects. Special attention is paid to the techniques involved in removing articulatory errors of elementary and secondary school children. Students develop their own exercises and activities and learn to adapt them to the goals of therapy. It is recommended that it be taken concurrently with Speech 173, Advanced Clinical Practice. (2W) Stock
173. Advanced 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
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

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) 

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) Hansen 


201. Thesis. (2 to 5F, W or S) Staff 

290. Research Studies. Advanced research in Speech. Credit arranged. (F, W, S) Staff
College of Science
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Degrees Offered:
  Bachelor of Science
  Master of Science
  Doctor of Philosophy
College of Science

The College of Science comprises the eight departments of Applied Statistics and Computer Science, Bacteriology and Public Health, Botany and Plant Pathology, Chemistry, Geology, Mathematics, Physics, and Zoology.

All of these departments have been functioning for a long period. Applied Statistics and Computer Science and Botany and Plant Pathology have been located in the College of Agriculture. All of the others have been part of the college previously known as the College of Humanities and Sciences. No changes are presently contemplated in the curricula of these departments nor in the graduation requirements. They will continue to function as in the past with the single exception that administratively all of the basic sciences are combined in one college with a new dean.

Utah State University has always given high place to the sciences. The new organization, effective July 1, 1962, gives them even greater status. Our twentieth century civilization is based on science, and every facet of this great area is fundamental in a Land-Grant University such as this one.

The curricula of the science departments in the past and future are designed to achieve four purposes:

First, they serve all students, because no college graduate today can be considered educated without a firm grasp of scientific principles. The sciences are truly liberal. They contribute to the general education as surely and as importantly as the humanities and the arts and the social sciences.

The second purpose of the College is to train teachers of science. This is an increasingly significant responsibility. America cannot move forward unless it has competent, well trained teachers of science on every level of education.

Third, the health professions are properly grounded on science. The University has an excellent record in providing pre-dental and pre-medical training. These students move directly into the professional dental and medical schools of other universities. The basic training of these people will continue to be an important part of the program in the College of Science.

Finally, the College of Science trains specialists in the various areas of science. To become a competent chemist, physicist, or geologist, the student must have a sound undergraduate major in the subject, followed by years of graduate specialization in his field. All of the departments mentioned above offer the bachelor's and master's degrees and the majority of them offer the PhD degree. The production of able specialists is of prime importance and is a major function of the departments in the new college, as it has been in the past.

The opportunities for competent and conscientious students in the various science fields is unlimited. The demands for teachers and researchers are far greater than the supply. The monetary rewards are substantial and the spiritual and intellectual rewards satisfying. Science is challenging. It demands the best from students, but for those who succeed it offers a rich return.
Applied Statistics, Computer Science

PROFESSOR Rex L. Hurst, HEAD; ASSISTANT PROFESSORS Neeti R. Bohidar, Wendell L. Pope, Donald V. Sisson.

Office in Main 15

Applied Statistics

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 one to go on for graduate work in the many universities of the nation where graduate programs are established. Applied Statistics majors are prepared to accept positions as members of research teams in business, manufacturing concerns, research organizations, and agricultural experiment stations. There are unlimited opportunities for outstanding employment and professional advancement.

For a major in Applied Statistics students are expected to complete Applied Statistics 131, 132, 141, 171, 172, 215, and 220. They are also expected to take extensive work in the Mathematics Department. It is advisable that a major in Applied Statistics have a strong minor in one of the fields of application. An undergraduate minor in Applied Statistics should consist of Applied Statistics 131, 132, 141, 215, and 220.

A graduate minor should consist of the same course work as that for the undergraduate major. Applied Statistics 261, 262, 263 are preferred to 171, 172.

Suggested Four-Year Curriculum

**Freshman and Sophomore Years**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Communications (1, 2, 3)</td>
<td>9</td>
</tr>
<tr>
<td>Math (45, 46, 97, 98, 99)</td>
<td>25</td>
</tr>
<tr>
<td>Biological Science (Bot. 24, 25; Zool. 3, 4; Bact. 10 or 70, 71)</td>
<td>15</td>
</tr>
<tr>
<td>Chemistry</td>
<td>15</td>
</tr>
<tr>
<td>Language¹ (Russian 1, 2, 3 or German 1, 2, 3 or French 1, 2, 3)</td>
<td>15</td>
</tr>
<tr>
<td>M.S. or P.E.</td>
<td>6</td>
</tr>
<tr>
<td>Economics (51)</td>
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</tr>
<tr>
<td>Political Science (1 or 10)</td>
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<tr>
<td>Electives</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>99</strong></td>
</tr>
</tbody>
</table>

**Junior and Senior Years**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics (17, 18, 19, or 20, 21, 22)</td>
<td>15</td>
</tr>
<tr>
<td>Computer Science (145, 146, 167)</td>
<td>9</td>
</tr>
<tr>
<td>Electives</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>98</strong></td>
</tr>
</tbody>
</table>

¹Other University requirements for the Language and Arts group may be substituted if approved by the department.
Computer Science

The use of electronic digital computers is one of the fastest growing areas of interest in today's society. Computers are used extensively in science, business, and research.

Computer Science deals with the methods and theory of programming a digital computer to handle all types of numerical information. Programming a computer consists of instructing it in step-by-step sequence so that it will solve a problem. The languages available for doing this are the basic machine language, symbolic languages, and problem-oriented compiler languages.

Computer Science courses are offered as service courses for all departments of the University, and are designed to acquaint students with the characteristics of digital computers and programming languages. Emphasis is placed heavily on the University's own computer.

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: Math 35 or equivalent. Three lectures, one lab. (4S) Staff

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

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

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: 131 or equivalent. Three lectures. (3S) Staff

171. Statistical Theory for Research Workers. An introduction to the theory of statistical inference; probability; discrete and continuous probability density functions and their properties; expected values; variances, moments, cumulants and their generating functions; orthogonal linear functions; sampling distributions; central limit theorem. Prerequisite: Calculus. (3F) Staff

172. Statistical Theory for Research Workers. Optimum properties of estimators; theory of point estimation; principle of maximum likelihood; theory of confidence interval estimation and test of hypothesis; likelihood ratio test; goodness-of-fit test; theory of least squares; general linear hypotheses and their application to regression and experimental design. Prerequisite: 171 (3W) Staff

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

220. Intermediate Statistical Methods. Special situations in the analysis of variance; general least squares analysis; multiple comparisons; polynomial and other non-linear curve fitting. Prerequisite: 132 (3S) Hurst

221. Industrial Statistics: Sampling Inspection. Control of quality of manufactured products; attribute and variable inspection; single, double and sequential plans; sampling plans for continuous production; cost functions and elementary decision functions. Prerequisite: 172 or Math 163. (3Su) Hurst

261, 262, 263. Intermediate Theory of Statistics. Development of distribution theory from the theory of probability; common distribution functions; derivation of sampling distributions with particular attention to normal populations; estimation by maximum likelihood; likelihood ratio tests of parametric hypotheses theory; elements of sequential analysis; distribution free methods. Prerequisites or corequisites: Math 130, 131, or 140, 141. (3F, 3W, 3S) Bohidar

281. Sampling Design. Principle steps in sample surveys; simple random sampling; properties of the estimators; sampling for proportions and percentages; estimation of sample size; two stage sampling; stratified random sampling; optimum allocation; stratified random sampling for percentages. Prerequisite: 172 or Math 163 (Taught on demand). (3F) Hurst
220 College of Science

282. Sampling Design. Ratio estimates; regression estimates; systematic sampling; subsampling with units of equal and unequal size; double sampling; source of error in sample surveys. Prerequisite: 281. (Taught on demand.) (3W)

289. Experimental Design. Principles of statistical design for experimental investigations to general linear hypotheses; Markoff's theorem; estimation and tests; theory of randomization and randomization tests; completely randomized designs; randomized blocks, latin squares, Graeco-latin squares; general treatment of missing-value techniques; sensitivity of randomized experiments. Prerequisite: 172 or Math 163 (Taught on demand). (3F)

291. Experimental Design. Experiments involving several factors; confounding in 2n, 3n and introduction to general Pn factorial systems; mixed factorial systems; fractional replication; split-plot experiments; introduction of quasi-factorial and incomplete block designs; determination of optimum conditions; exploration of response surface. Prerequisite: 291. (Taught on demand.) (3W)

Bohidar

Computer Science Courses

1. Digital Computer Utilization. Introduction to the use of digital computers in problem solving and data processing, utilizing assembly processor languages. Techniques of machine operation; accuracy of solution; introduction to numerical methods; digital computers in data processing; history of digital computers; future computer possibilities. Prerequisite: Math 35. (1W, 1S)

45. Computers and Society. A general survey of computers, their capacity and limitations. Examples of computer usage. (1F)

Hurst

111. Data Processing. Methods of collecting and analyzing research data using data processing machines; card design; coding methods and form design; procedures in handling enumeration and measurement data; use of punch card equipment and high speed computers. Two lectures, one lab. Prerequisite: Math 35. (3F)

Hurst

145. Computer Programming. History of computing equipment; philosophy of computing; the organization of problems for solution using a computer; characteristics of the University's IBM 1620 computer; the use of machine language programming in problem solving. Two lectures, one lab. Prerequisite: Math 35. (3W)

Pope

146. Computer Programming. Machine language and symbolic programming for the IBM 1620. Students are expected to gain the programming proficiency to be able to solve problems in their own field. Two lectures, one lab. Prerequisite: 145. (3S)

Pope

167. Problem-oriented Programming. Discussion of problem-oriented programming languages (compilers); the use of a compiler language to write programs for a computer. Students are expected to learn a programming language and solve problems in their own field using a computer. Two lectures, one lab. Prerequisite: Math 35. (also listed as Electrical Engineering 167). (3F, 3W, 3S)

Staff
Department of

Bacteriology and Public Health

(Bacteriology, Public Health, Medical Technology)

PROFESSORS W. Whitney Smith, 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. A General Bacteriology major requires: 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 150; Botany 24 or 25; Zoology 3, 4, 107, 112, 116.

A Public Health major requires: Public Health 15, 50, 150, 155, 254; Bacteriology 10 or 70, 71, 160; Physiology 4, Physics 6, Zoology 3, 112, 116; Entomology 115; Physical Education 55, 135, 145; Psychology 100 or Family and Child Development 100; Psychology 145 or Sociology 162; Food and Nutrition 5, Chemistry 10, 11, 12.

For a Health Education major consult H. B. Hunsaker, Department Head of Health, Physical Education and Recreation.

For a minor in Health Education take: Public Health 15, 50, 150; Physical Education 135; Food and Nutrition 5 and Psychology 145.

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, spectograph, flame spectrophotometer, and other major research instruments.

Master of Science in Bacteriology. (See also “Master of Science Degree” in School of Graduate Studies in this Catalog.) The Master's degree in bacteriology combines a substantial research effort with a rounding out of course work in bacteriology and related subjects. At the conclusion of the Master's degree candidates are expected to have completed 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 degree. A doctoral thesis comprising an intensive and definitive contribution to knowledge is the most basic requirement. In previous training or in the doctoral program, candidates are expected to have course work in Bacterial Physiology, Systematic Bacteriology, Soil
or Industrial Bacteriology, Mycology, Protozoology, Virology. They 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.

Candidates 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 PhD degree in bacteriology must have received the equivalent of forty 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 Bacteriology 10 or 70. Two 3-hour labs. (2F, W, S) Jones, Stevens, Roberts

*104. Dairy Bacteriology. Micro-organisms of milk and its products. Prerequisite: Bacteriology 10 or 70. (3S) Jones

*105. Dairy Bacteriology Laboratory. Two 3-hour labs. Prerequisite: Bact. 71, and previous or concurrent registration in Bacteriology 104. (2S) Jones

**110. Soil Microbiology. Relationships of micro-organisms to soil fertility. Prerequisite: Bacteriology 10 or 70. (2S) Jones

*120. Food Microbiology. Relationships of micro-organisms to food preservation, spoilage, and poisoning. Prerequisite: Bacteriology 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: Bacteriology 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) Staff

180. Physiology of Bacteria. Cellular chemistry and physiology. Prerequisites: Bact. 10 or 70, Organic Chemistry. (4W) Jones

**201. Systematic Bacteriology. Classification relationships. Prerequisite: Bacteriology 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

**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) Roberts, Stevens, Members of Cache Valley Medical and Dental Associations

*Taught 1962-63.

**Taught 1963-64.
should take during the first three years: Bacteriology 10 or 70, 71, 160, 168; Chemistry 3, 4, 5, 12, 115, 190; Physiology 4; Physics 6; Zoology 3, 4, 116. A hospital internship for twelve months is completed during the fourth year. This includes instruction in Medical Technology 131, 133, 134, 135, 136, 137, 138, 139. USU has provision for instruction of laboratory technicians in this internship in the LDS hospitals of Salt Lake City, Ogden and Idaho Falls, and at St. Benedict's hospital in Ogden. During this fourth year students register for three quarters (45 upper division credits in Medical Technology). When this program is satisfactorily completed, a student is eligible for the Bachelor of Science degree in Medical Technology. A student may then also apply for certification by the Registry of Medical Technologists, after completion of a qualifying examination given by the American Society of Clinical Pathologists. Consult Professor P. B. Carter for further details.

Medical Technology Courses

131. Clinical Laboratory Methods. Prerequisite: Bacteriology 71. (48) 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


139. Pathological Conference. (1S) Carter

Medical Technology

The College of 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.

A Medical Technology major

50. Elementary Public Health. A basic course in the principles of public health with major emphasis on health education, control of communicable diseases, community sanitation problems, radiological health and related areas of health. (3F) 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. (3W) 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


**156. School Health Methods.** Objectives, methods, curricula, and materials. Prerequisite: P.H. 155. (8S)

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

*Taught 1962-63.
**Taught 1963-64.
Department of

Botany and Plant Pathology

(Cytogenetics, Plant Pathology, Plant Physiology, Taxonomy, Virology)


Office in Plant Industry 201

Education for future professional work in Botany is the primary objective of the Botany curriculum. Students should have thorough undergraduate training in botany, supported by chemistry, mathematics, physics, and related biological sciences. If graduate study beyond the Master of Science degree is planned, a reading knowledge of at least one foreign language should be acquired. Employment is found in universities and colleges, the US Department of Agriculture, State Agricultural Experiment Stations, and in Industry. This curriculum also provides excellent training for students who desire to become teachers of biological sciences in high schools and colleges.

In addition to the general University group requirements for the BS degree, students should take Botany 24, 25, 30, 116, 117, 120, 130, 240; Chemistry 3, 4, 5; Math 35; Zoology 112. Under exceptional circumstances some upper division Botany classes may be substituted for one of the classes above and Chemistry 10 and 11 may be substituted for Chemistry 3, 4, 5.

To supplement the foregoing courses, students with their adviser should select additional courses from the following recommended courses for fields of specialization.

**Cytogenetics:** Botany 104, 118, 150; Chemistry 121, 122, 190; Physics 141; Zoology 3, 4, 131.

**Plant Pathology and Virology:** Botany 125, 150; Appl. Stat. 51, 131, 132; Bacteriology 70, 71; Chemistry 121, 122, 190; Entomology 108; Horticulture 131; Math 46, 97, 98, 99; Physics 17, 18, 19; Zoology 3.

**Plant Physiology:** Agronomy 106; Botany 150, 224; Chemistry 101, 115, 121, 122; Math 46, 97, 98, 99; Physics 17, 18, 19, 140, 141; Physiology 130; Zoology 3, 4.

**Taxonomy:** Agronomy 56; Botany 104, 108, 112, 118, 125, 150; German 1, 2, 3; Latin 1, 2, 3; Range Management 126; Zoology 107, 131.

**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, Virology. Graduate studies are also offered in the Interdepartmental Curriculum in Plant Nutrition and Biochemistry.
The opportunities and facilities for research in these fields are greatly augmented through the cooperation of the USU Agricultural Experiment Station, United States Department of Agriculture, and the Intermountain Herbarium.

A candidate must submit a thesis on a topic within the field of his 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 Inter-departmental Curriculum in Plant Nutrition and Biochemistry. Detailed information may be obtained from the department.

**Herbarium**

Graduate study in plant taxonomy offered in the Department of Botany utilizes the extensive facilities of the Intermountain Herbarium. Most plant species that grow in Utah and the Intermountain region are represented in 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. (6F, 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. (5W) 
   **Holmgren, Shaw**

**104. Evolution of Cultivated Plants.** Origin, evolution and distribution of certain selected plants which are of economic importance to man. Prerequisites: Botany 25, 30, Zoology 112 or equivalent. Lectures, readings and student reports. (3S) 
   **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 the 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; efficient 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. **Cylogenetics.** The structure, functions and modifications of chromosomes and their relationships to genetic phenomena. The laboratory emphasizes plant materials. Prerequisite: Zoology 112. 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 Chemistry 12. (Chemistry 12 may be taken concurrently.) Four lectures, one lab. (5W, S) 
   **Wiebe**

**121. Water Relations of Plants.** Factors affecting the availability of water, its absorption and use in plants, and the effects of water deficits on plant processes. Prerequisite: Botany 120. (3W) 
   **Wiebe**

*Taught 1962-63.
**Taught 1963-64.
226 College of Science

*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. (5S) 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)

*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 industry. Prerequisite: Botany 25. Three lectures, two labs. (5W) Cannon

*224. Plant Growth and Development. Growth processes, with emphasis on hormones, photo-period, 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, 120 and Chemistry 12. 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 1962-63.
**Taught 1963-64.
Department of Chemistry


Office in Widtsoe Hall 111

Major. The degree of Bachelor of Science in Chemistry is a professional degree. Graduates who meet the requirements of the American Chemical Society, by which the Department is approved, and who fill the requirements of the University as given in this catalog, will be certified by the Society. 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, 122, 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. Students interested in obtaining a degree in Chemical Engineering 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, the student must pass examinations in General Chemistry, Qualitative Analysis, Quanti-
Chemistry Major Curriculum

**FRESHMAN**

<table>
<thead>
<tr>
<th>Courses</th>
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<td>Mathematics 35, 46, 97</td>
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<td>English 1, 2, 3</td>
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<td>3</td>
<td>3</td>
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<td>Military or Air Science or Physical Ed.</td>
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<td>Electives</td>
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**Total**                                  17 17 17

**SOPHOMORE**

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<th>Courses</th>
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<tr>
<td>Mathematics 98, 99, 110</td>
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<td>(or 97, 98, 99)</td>
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<tr>
<td>Chemistry 121, 122, 115</td>
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<td>Physics 20, 21, 22</td>
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<td>Military or Air Science or Physical Ed.</td>
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**Total**                                  16 16 16

**JUNIOR**

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<td>Chemistry 190, 194</td>
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<td>Chemistry 104, 105, 106</td>
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<td>Electives, group requirements</td>
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**Total**                                  17 17 18

**SENIOR**

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<td>Physics 122, 130</td>
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<td>Chemistry 152, 153, 160</td>
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<td>Chemistry 160</td>
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<td>Chemistry 198, 199</td>
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<td>Advanced Physical or Organic</td>
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<td>Electives, group requirements</td>
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**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. Prerequisite: two of the following high school courses: advanced algebra, chemistry, physics or equivalent. Three lectures, two labs. (5F, 5W, 5S) Lee

10, 11. *General Chemistry.* Principles of inorganic chemistry. Prerequisites: One unit of high school or college algebra. Four lectures, one lab. (5F, 5W, 5S) Staff

12. *Elementary Organic Chemistry.* An introduction to organic chemistry. Designed to follow Chemistry 11 and completes a one-year terminal course in chemistry. (5S) Staff

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) Maeser
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: Chemistry 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: Chemistry 5, 115; Physics 20, 21, 22; Math 99. Three lectures. (3F, 3W, 3S) Moore

108. Dairy Chemistry. The chemistry of milk and milk products, including tests for adulterants, preservatives, and routine methods of quantitative analysis of dairy products. Prerequisite: Chemistry 190. (4W) Van Orden

109, 110, 111. Experimental Physical Chemistry. Laboratory work correlated with Chemistry 104, 105, 106. (1F, 1W, 1S) Moore

115. Quantitative Analysis. Basic theory and laboratory practice in gravimetric and volumetric analysis. Prerequisites: Chemistry 5, Math 35. Three lectures, two labs. (5S) Cannon

116. Inorganic Preparations. A laboratory course in practical methods of synthetic inorganic chemistry. Prerequisite: Chemistry 5. (Credit arranged) Lee

121, 122. Organic Chemistry. Fundamentals of the chemistry of carbon compounds. Prerequisite: Chemistry 5. Four lectures, one lab. (5F, 5W) Smith, Stermitz, Larson

124. Organic Preparations. An advanced laboratory course in the synthesis of complex compounds. Prerequisite: Chemistry 122. (3F) Smith, Larson

134. Qualitative Organic Analysis. The classification, reactions and laboratory work involved in the identification of unknown organic compounds. Prerequisites: Chemistry 115, 122. (4S) Larson

135. Chemical Literature. Exercises in finding, assembling and using information available in technical publications. (3S) Staff

136. Inorganic Chemistry. Study of the elements, compounds and bonding theories based upon the atomic structure. Prerequisite: Chemistry 104. Three lectures. (3S) Lee

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: Chemistry 106, 115. Two lectures, one lab. (3F) 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: Chemistry 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: Chemistry 106. Three lectures. (3F) Moore


217. Advanced Physical Chemistry. Chemical kinetics, molecular structure and advanced topics. Prerequisite: Chemistry 216. (3S) Moore

218. Quantum Chemistry. Wave mechanical applications to problems of chemical bonding. Prerequisite: Chemistry 216. Three lectures. (3F) Staff


228, 229. Theoretical Organic Chemistry. Structure and mechanism in organic chemistry with emphasis on electronic interpretations and kinetics. Three lectures. (3F, 3W) Smith, Stermitz
230 College of Science

230. Synthetic Organic Chemistry. A study of recent methods of organic synthesis. Three lectures. (3S) Staff

231. Heterocyclic Compounds. (3F) Stemitz

232. The Colloidal State and Surface Chemistry. Application of physical-chemical principles to surface phenomena. Fundamental properties and theories of colloidal dispersed systems. Examples of colloidal behavior selected from diverse fields. Prerequisites: Chemistry 215; Math 99. Three lectures. (3W)

233. Special Topics in Organic Chemistry. Three lectures. (3F, 3W, 3S) Staff

250. Advanced Inorganic Chemistry. Modern topics and theories in inorganic chemistry. Prerequisites: Chemistry 106, 150. 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: Chemistry 216; Math 99. Three lectures. (3S) Staff

253. Advanced Chemical Kinetics and Rate Theory. Fundamental principles governing reaction rates. Advanced topics. Prerequisites: Chemistry 217, 219. Three lectures. (3S) Staff

260. Graduate Seminar. (1F, 1W, 1S) Staff

270. Advanced Topics in Analytical Chemistry. Modern developments in quantitative analysis, methods of separation, statistical treatment of data, measurement of pH, and other topics. Prerequisites: Chemistry 106, 152. Three lectures. (3F) Cannon, Spence

271. Advanced Instrumental Analysis. Radiochemical methods, mass spectrometry, electron microscopy. Prerequisites: Chemistry 106, 153. Three lectures. (3F) Staff

272. Advanced Topics in Analytical Chemistry. Special Problems. Credit arranged. (F, W, S) Staff

273. Advanced Analytical Chemistry. Special Problems. Credit arranged. (F, W, S) Staff

274. 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

275. Advanced Biochemistry: Enzymes. Enzymes and their functions in plants and animals. Prerequisites: Chemistry 101, 190. Three lectures. (3W) Van Orden

276. Advanced Biochemistry: Principles of Metabolism. Carbohydrates, fats and proteins and their metabolism in plants and animals. Prerequisites: Chemistry 101, 190. Three lectures. (3S) Van Orden

277. Advanced Biochemistry: Vitamins. Vitamins and hormones and their functions in plants and animals. Prerequisites: Chemistry 190. Three lectures. (3F) Van Orden

278. Graduate Research. Credit arranged. (F, W, S) Staff

290. Toxicology. The effects of selected chemical compounds on living organisms. Prerequisites: Chemistry 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 Chemistry 290. Two labs. (2S) Greenwood

292. Advanced Biochemistry Lab.: 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: Chemistry 190. To accompany or follow Chemistry 296. Two labs. (2 or more S) Van Orden

293. Advanced Biochemistry Lab.: Biochemical Preparations. Preparation of enzymes, and amino acids. Prerequisite: Chemistry 190. To accompany Chemistry 296. Two labs. (2 or more W) Van Orden

294. Advanced Biochemistry Lab.: Biological Assays. Microbiological and colorimetric methods for determination of vitamins and amino acids in plant and animal tissues. Prerequisites: Chemistry 190; Bacteriology 70 or 71. To accompany or follow Chemistry 297. Two labs. (2 or more F) Van Orden

295. Advanced Biochemistry: Enzymes. Enzymes and their functions in plants and animals. Prerequisites: Chemistry 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: Chemistry 101, 190. Three lectures. (3S) Van Orden

297. Advanced Biochemistry: Vitamins. Vitamins and hormones and their functions in plants and animals. Prerequisites: Chemistry 190. Three lectures. (3F) Van Orden

298. Graduate Research. Credit arranged. (F, W, S) Staff
Department of

Geology

PROFESSOR J. Stewart Williams, HEAD; ASSOCIATE PROFESSORS Clyde T. Hardy, Donald R. Olsen.

Office in Main 286

Bachelor of Science Degree. For a major in Geology the following courses are required: 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.

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 majors in Geology, Forest and Range Management, Engineering, Agronomy, and 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 1 or 3. (3S) Olsen


101. Mineralogy. Identification of minerals by physical and chemical tests. Elementary crystallography. Prerequisites: Geology 3 and Chemistry 10, 11. (5F) Olsen


103. Engineering Geology. Application of geology to engineering problems. (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


232 College of Science

115. Surficial Geology. Processes active on surface of earth, unconsolidated deposits, and geomorphology. Recent geologic events. For majors in Forest and Range Management, Engineering, and Agronomy. Prerequisite: Elementary geology. (5F) Staff

116. Special Problems. Directed study of selected problems. Written report required. (1-6 F, 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

119. Graduate Seminar. (2-5 F, W, S) Staff

120. Stratigraphic Paleontology. (3F) Williams

121. Paleozoic Stratigraphy. (3W) Williams

122. Mesozoic and Cenozoic Stratigraphy. (3S) Hardy

123. Regional Tectonics. (3W) Hardy

124. Petrography. (3S) Olsen

125. Petrogenesis. (3F) Olsen

126. Thesis. (5-15 F, W, S) Staff

Department of Mathematics
(Mathematics and Mathematical Statistics)


Office in Engineering-Physical Science C-306

Two majors are offered by the Mathematics Department for the Bachelor of Science degree. Students intending to enter graduate study in Mathematics, those intending to teach Mathematics in a junior college or a university, and those expecting industrial employment as mathematicians take the regular major. Those intending to teach Mathematics in the secondary schools may elect to fill the requirements for a teaching major.

Regular majors are required to complete Mathematics 110, 130, 131, 132 and fifteen additional credits of upper division Mathematics selected from courses other than 140, 141, 142, 150, 151 and 152. Physics 20, 21 and 22 are required and nine credits of upper division Physics are recommended.

Those expecting to obtain a degree higher than a B.S. degree in Mathematics should have a reading knowledge of French, German, or Russian.

A department-approved teaching major must include Mathematics 99, 150, 151, 152 and an additional nine credit hours of upper division Mathematics selected from Mathematics 120, 123, 124, 175 or other courses meeting departmental approval.

A department-approved teaching minor must include Mathematics 98 and 150, and should include Mathematics 120 and 124.

All students majoring in Mathematics must have had Plane and Solid Geometry. Plane Geometry
iis a prerequisite for all university mathematics except Mathematics 20, 34, 35 and 60.

If a student completes 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. Credit will not be given for both Math 24 and Math 34. 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

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

134. Elementary Metric Topology. Prerequisite: 99. (3) 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

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

175. Teaching of Mathematics in the Secondary Schools. Prerequisite: Math 152. (3S) Staff
Mathematical Statistics

Students 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 students wish to major or minor in Statistics, they take 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 1963-64.
Department of

Physics

Professor John K. Wood, Head; Associate Professors Jack E. Chatelain, Jürgen 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. A Physics major must complete a senior project approved by the department. The following sequence of courses is recommended for students wishing to continue in graduate study in 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 153, 154, 155, 188; Mathematics 130, 131, 132 or 140, 141, 142; Physics 166, 167, 168 or electives.

Senior Year: Physics 125, 126, 127, 175, 176, 177, 188 or electives.

A minor in Physics will be approved on completion of Physics 153, 154, 155 or Physics 175, 176, 177. Nine credits of upper division Physics courses including 122 and 130 may be substituted on departmental approval.

Teaching Major: For a teaching major in Physics or a composite teaching major in Physics and Mathematics, a student should complete the following minimum program: Physics 17, 18, 19, 122, 130, 131, three credits in 188; Mathematics 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. A candidate for the degree of Master of Science in Physics 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. A student having earned fewer than six credits in certain of these five fields may be requested to take additional work in those areas as part of the work for the Master's degree.

Doctor of Philosophy Degree. The Physics Department in cooperation with related departments offers the Doctor of Philosophy degree. 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 the 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


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. (S, Su) Credit arranged. 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

122. Modern Physics. For engineering, science, and teaching majors. (3F) Jensen

125, 126, 127. Modern Physics. Application of special relativity and quantum mechanics to atomic physics, molecular physics, solid state physics, x-rays and nuclear physics. Prerequisite: Physics 155 or 177. Three lectures, one recitation. (4F, W, S) Edwards

130. Nuclear Physics. A survey of methods and results of recent investigations of nuclear processes. To follow Physics 122. (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

140. Biophysics I. Foundations of physical measurements in biology with emphasis on optical methods: microscopy including phase and interference, spectroscopy, X-ray techniques, crystal analysis. Prerequisite: Physics 19 or 20. (3F) Meyer-Arendt

141. Biophysics II. Introduction to quantitative biology. The underlying physical principles involved in biophysical phenomena are discussed. Prerequisite: Physics 19 or 22. (3W) Staff

143. Radiobiology. Designed to acquaint students in Medical Technology, Botany, Zoology, Pre-medicine, Pre-veterinary and Agriculture with a foundation of techniques in health physics, radiation monitoring and measuring and isotope handling. Prerequisite: One quarter of general physics. (3) Jensen

146. Sound. An intermediate course in sound and vibration. (3S) Wood


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 8 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. (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.


214. Soil Physics. (See Agronomy 214.)

220, 221, 222. Atomic Spectra, Molecular Spectra, and Spectographic Measurements. (3F, 3W, 3S) Staff

230, 231, 232. Nuclear Physics. (3F, 3W, 3S) Staff

240, 241, 242. Advanced Biophysics. (3F, 3W, 3S) Staff

250. Research in Physics. Credit arranged. (F, W, S) Staff

260, 261, 262. Thermodynamics, Kinetic Theory, Statistical Thermodynamics. (3F, 3W, 3S) Staff

270, 271, 272. Quantum Field Theory. (3F, 3W, 3S) Staff

285, 286, 287. Introductory Quantum Mechanics. Prerequisite: Advanced Calculus. (3F, 3W, 3S) Staff


293, 294, 295. Graduate Seminar in Physics. (1F, 1W, 1S) Staff

296, 297, 298. Theoretical Electricity and Magnetism. (3F, 3W, 3S) Edwards

Zoology 237

Department of Zoology

(Zoology, Entomology, Physiology, Pre-Dentistry, Pre-Medicine, Nursing)


Office in Forestry-Biological Sciences 105

Bachelor of Science Degree. For a major in Zoology the following courses must be taken: Zoology 3, 4, 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 one is planning graduate work leading
toward the PhD 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 107, 127 or 128, 131, and either 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 Arts.

3, 4. General Zoology. Detailed study of the animal kingdom with emphasis on structure, function, evolutionary relationships and natural history. Zoology 3 is primarily concerned with the invertebrate phyla and is a prerequisite for Zoology 4, which emphasizes the vertebrates. Three lectures, two labs. (5F, 5W, 5S)

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 25 and 25. Four lectures, one lab. (5F, 5W, 5S) *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. (5S) *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) *Dixon*

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. Field Zoology. Study of the most common Utah animals, including identification, natural history, distribution, ecology, etc. Also methods of study in the field, and collection and preparation of specimens for study, display and storage are considered. Some laboratory time is spent in making observations and collections in the field. Prerequisites: Zoology 3 and 4. 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. (5W) *Bahler*
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

Three lectures. (3W) Sigler

156. Ichthyology Laboratory. Laboratory study of fishes. Must accompany or follow Zoology 155. Two labs. (2W) 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

212. Biochemical Genetics. Concepts of genetic function at the chemical and molecular level, with emphasis on current literature. Prerequisite: Zoology 112, Chemistry 122; recommended, Chemistry 190. Three lectures. (3W) Simmons

213. Biochemical Genetics Laboratory. Experimental methods used in research in biochemical genetics. Must accompany or follow Zoology 212. Two labs. (2W) Simmons

214. Advanced Genetics. Intensive study of heredity and variation with emphasis on current research. Prerequisite: Zoology 102 or 112. (3F) 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) Staff

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) Staff

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 239

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. Stu-
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) Haws

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 concepts of ecology, ecological relationships, and measurement of ecological factors of importance in Entomology. The impact of changes in environmental conditions on insect populations also are considered. Prerequisites: Zoology 3 and Entomology 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

135. 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


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. (5W) 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

*Taught 1962-63.
**Taught 1963-64.
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. Prerequisite: 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) Sanders

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) Staff

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 6F, 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) Staff

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
**Pre-Dentistry**

Students planning to enter dentistry 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:**

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<td>Chemistry 3, 4, 5</td>
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Recommended electives are Psychology, History, Political Science, Sociology, Economics, Scientific Vocabulary, and other English courses.

Students planning to receive a BS degree in a combined curriculum (three years here and one year in a dental school) must fulfill the

*Military Science or Air Science would be two credits each quarter.

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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**Pre-Medicine**

The College of 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:**

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Electives should be chosen from the Humanities, Arts and Social Sciences. Some medical schools require or recommend Comparative Anatomy.

Students interested in graduation from USU before attending medical school may major in any subject.

If interested in a pre-osteopathic program students should consult the premedical adviser.

If planning to receive a BS degree in a combined curriculum...
(three years here and one year in a medical school) students must fulfill requirements of USU and must complete a minimum of 141 credits of pre-professional work.

**Nursing**

If students have Registered Nurse credentials they may pursue studies toward a Bachelor of Science degree in Nursing. Credits earned toward the RN are applied toward the BS, as evaluated by the Registrar. A student may be graduated with a major in Nursing or may complete studies for a degree in a field such as Public Health or Bacteriology.
Division of
Military and Air Sciences
Division of

Military and Air Sciences

Joint Army-Air Force Courses and Activities, 248

Department of Air Science, 250
   Air Force ROTC, 250

Department of Military Science, 255
   Army ROTC, 255

Degrees Offered:
   Bachelor of Science
   Also, ROTC Commission
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. Men may initially choose which program they wish to enter; however, subsequent transfer between units is not generally approved because of the difference in curriculum.

Army and Air Force ROTC are four-year programs, each consisting of two two-year courses. The Basic course is normally taken during the 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 the 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 prerequisite for 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, students normally enter on active duty with the Armed Forces as a second lieutenant in the service in which they are commissioned. The period of active service required of ROTC graduates depends on the requirements of the service concerned.

Enrollment Regulations. ROTC leadership, drill and command periods are an integral part of the ROTC program. Registration for one of these periods is required of all ROTC students. 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 a student 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 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 advanced 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.

Joint Activities 249

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. Air Science Sponsors Drill, Freshmen. A course in leadership organization and drill for women elected to Corps of Sponsors. Staff
54, 55, 56. Air Science Sponsors, Sophomores. Staff
151, 152, 153. Air Science Sponsors Drill, Juniors. Staff
154, 155, 156. Air Science Sponsors Drill, Seniors. Staff

Pershing Rifles Courses

37, 38, 39. Pershing Rifle Drill, Freshmen. Staff
40, 41, 42. Pershing Rifle Drill, Sophomores. Staff
137, 138, 139. Pershing Rifle Drill, Juniors. Staff
147, 148, 149. Pershing Rifle Drill, Seniors. Staff
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 in a specific field, but rather to give an understanding of the mission and the global responsibilities of the United States Air Force. The academic phase of the course develops a background in national and international affairs to help students intelligently interpret and evaluate world events.

Summary of the AFROTC Curriculum. The AFROTC curriculum 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 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 students 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 a student as an Air Force Officer much of it will be useful to him 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. A cadet's physical examination for entry into the University will generally determine whether or not he meets these requirements.

_Veterans._ A veteran is accepted into the AFROTC program without regard to quota spaces. If he can complete the program prior to reaching age 28 and can meet the physical requirements for general service, he may be commissioned a Second Lieutenant in the Air Force Reserve and compete for a career as a regular Air Force Officer. Veterans 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. He may also compete for pilot and navigator spaces, and if accepted must complete the Flight Instruction program (Pilots) in the Senior year and the active duty requirements.

_Special University and AFROTC Requirements._ Once a student enters the basic or advanced program, successful completion of that program becomes a requirement for graduation, unless relieved of the requirement by the Professor of Air Science or the President of the University. In addition, when entering the Advanced Course a student must agree to accept an Air Force Commission, if it is offered, and to serve on active duty if directed to do so.

Upon initial enrollment at the University, Air Science classes should be scheduled to complete simultaneously, requirements for a degree and a commission. If an engineer under a five-year program, he should plan his Air Science program in advance with his 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. To qualify as a pilot or navigator, cadets must be able to finish the Air Science program and graduate from the University before the age of 26½ years. Other cadets must complete the military program and graduate from the University prior to reaching the age of 28.

_Restrictive Commissions in the United States Air Force._ Outstanding AFROTC Cadets who have demonstrated a high degree of leadership, initiative, and 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._ To an advanced cadet a subsistence allowance of approximately $27 per
month is paid. The maximum amount paid for Junior and Senior years is approximately $600. While at Summer Training cadets will receive approximately $81 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 attendance to this camp is between the 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 a student is a cadet at the University and the other after he has received a commission and has graduated.

Cadets designated potential pilots are required to register for the AFROTC Flight Instruction Program (FIP) during their senior year. Successful completion of 36½ hours of flight instruction and a CAA examination enables him 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 the year of flight training in the U.S. Air Force as a Second Lieutenant, a cadet will receive full pay and allowances, plus flight pay, a total of approximately $5,600.

Non-Flying Cadets. To meet the challenge of the Aero-Space Age, its technological advances and its ever broadening horizons, officers possessing a variety of skills are required within the Air Force. These skills cover the exact sciences and social sciences but are not limited to these areas of study. In many of these fields cadets may be granted a year delay to acquire an advanced degree prior to their call to active duty. After the call to active duty they will serve four years in major fields of study. Interested cadets may contact the AFROTC Education and Training Officer for information of Air Force specialist fields related to their academic major.

Delay of Entry on Active Duty. If cadets complete the AFROTC program and receive commissions they may request a delay in call to active duty if they desire to continue studies toward a Master'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 the student.

Air Force Library. A library of Air Force periodicals and publications is maintained for the Air Force ROTC Cadet. Material relative to the Air Force ROTC curriculum is available.

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 "fellowship" 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, (1S); Sabre Squadron (Senior) 3AS 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: Fundamentals of Aerospace Weapon Systems. An outline of professional opportunities in the USAF. Also includes background of the military policy of the United States and the current national organization for defense. Aerospace missiles and aircraft, their propulsion systems, and the types of warheads used with aerospace weapon systems are also introduced. (2F) **Staff**

22. Air Science: Fundamentals of Aerospace Weapon Systems. An introduction to the principles, mechanics, and implications of chemical, biological, and nuclear weapons and warfare; the defensive, strategic, and tactical organizations and operations of the USAF, including modern targeting and electronic warfare. Also introduces problems, mechanics, and military implications of future space operations, and contemporary aerospace military thought. (2W) **Staff**

23. Air Science: Designated University Course. (For definition of Designated University Course, see Air Science 1 Curriculum.)


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**
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. (3S) Staff

133. Air Science: Air Force Officer Development. Leadership and Management Seminar. briefings and group emergency procedures, 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

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, 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 cadets to ride in jet aircraft. A minimum of two flights is permitted to each cadet, one thirty minute jet ride, and one ride in another type aircraft as a crew member. Cadets participate in pre-flight and post-flight briefings, and receive emergency equipment indoctrination. Demonstration and field trips are provided to airfield installations and fire power demonstrations. Practical leadership training is provided through group calisthenics, individual and group sports, familiarization firing of pistol and carbine and directing cadet operations. The cadet attends the Summer Training Unit between his junior and senior year. Exemption from attendance at this time is granted only by the Professor of Air Science based upon emergency situa-

tions of extreme hardship. If an exemption is granted, the cadet must attend summer training at the end of his senior year and will be commissioned upon successfully completing the summer training if his university degree requirements have been met. (6Su) Staff

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. (2F) 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 attempts to achieve some type of international Government. This study examines briefly the 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 Political Science 111 (International Organization) is the desired substitute for AS 143).

145. Flight Instruction Program. This course covers instructions in ground school, Civil Air 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 FAA flight examination. Subject open only to qualified senior AFROTC Cadets. Instruction arranged to not interfere with regular academic schedule. Prerequisite: 141. Navigation and Weather. (3F, W, S) Staff
ROTC’s purpose is to develop reserve officers in sufficient quantity to provide a nucleus of well educated, all-around leaders for an army that would have to expand rapidly in the event of a national emergency. In this present period of “limited” emergency, the program produces new second lieutenants for the Active Army and the Army Reserve. A limited number of Distinguished Military graduates are offered commissions in the regular Army.

To be eligible for a commission as a Reserve Second Lieutenant a student must not have reached his 28th birthday prior to appointment. If he is commissioned in the Army Reserve and unless he is a veteran or has completed flight training he will be required to serve either six months or two years on active duty. If a veteran, he may serve six months or no active duty— or he may request two years active duty, if desired. If he participates in flight training, he 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 optional as to whether or not students enroll in the Basic Course.

To enroll in the Basic Course, students must be either a (a) freshman, (b) sophomore with credit for High School ROTC or other military training, (c) sophomore pursuing a course requiring four more years to earn the Bachelor’s Degree.
After completion of the two-year Basic course and selection for further training, cadets may enroll in the Advanced course, subject to any quota limitations. Under the provisions of the contract between the University and the Department of the Army, the University agrees to require that each student who enrolls will complete the course as a prerequisite to his graduation. Therefore, if he enrolls in the Advanced course, he must complete that course unless relieved of this obligation by regulations prescribed by the Secretary of the Army. Signing of an ROTC draft deferment agreement as a Basic course student obligates him to elect enrollment in the Advanced course if 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 the MS I year a student must earn a minimum of three credits in one of the approved academic areas. During the MS III and MS IV years he must earn a minimum of four 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 advisers or from the staff of the Military Science Department. These are not additionally required courses but, in effect, ones granting "dual credit"—they fill requirements for a major and meet requisites for ROTC training leading to a commission.

Army ROTC Flight Training. This training is offered to selected Senior Army ROTC students who meet class I physical standards for flying. Instruction is so arranged that it will not interfere with ROTC or regular academic schedules. For acceptance in the course students must be enrolled in MS IV ROTC or have successfully completed MS 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 a student for a FAA private pilot's license. All training is conducted by FAA-approved instructors. If interested in participating in flight training see the Military Science class adviser for further information.

Summer Camp. Advanced ROTC cadets must participate in a six weeks summer camp held at Fort Lewis, Washington. Attendance is required between junior and senior years unless a subsequent period is specifically approved by the Commanding General, Sixth army. Practical application of classroom theory and living in the field make it an interesting and stimulating experience. Pay is received for the six week period and for travel to and from camp.

Veterans. Veterans may be given credit for all or part of the Basic course, depending upon length of service. Enrollment in the Advanced program is contingent upon
selection as in the case of other cadets.

High School ROTC. Students who have completed the three-year high school ROTC program may be given credit for the first year Basic course.

A major in Military Science is offered by the Army ROTC department. This major is intended to serve two categories: service personnel stationed at near-by military installations who desire to complete a degree while in the service, and college students interested in the possibility of making a career of the service. The latter who elect this major are required to complete a dual major, the purpose of which is to assure adequate preparation for the future in the event they are not selected or cannot qualify for a reserve commission. Further, it is not possible for a student to qualify for a major in Military Science if he fails to be selected for Advanced ROTC. Although all major fields at this institution are acceptable in a dual major, the following are particularly recommended: Engineering, Physics, Chemistry, Mathematics, Political Science, or Psychology. A freshman student electing Military Science as a major is advised to pursue one of the above fields. In addition to Basic ROTC he should concentrate on filling lower division group requirements and strive for a high grade point average.

Payment to Advanced Students. Upon enrollment in the Advanced course, students 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 students have completed the Army ROTC program and are commissioned they may delay entry upon active duty, if they 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: Capt. J. D. Smith

Courses
11. Military Science I. Organization of the Army and ROTC; U.S. Army and National Security; Leadership, Drill and Command. One class period and one leadership laboratory period per week. (1F) Williams

12. Military Science I. Continuation of Military Science 11. Individual Weapons and Marksmanship; Leadership, Drill and Command. One class period and one leadership laboratory period per week. (1W) Williams

13. Military Science I. Continuation of Military Science 12. U.S. Army and National Security; Leadership, Drill and Command. One class period and one leadership laboratory per week. (1S) Williams

MS II—Second Year Basic
DIRECTOR: Captain B. H. Williams

Courses
21. Military Science II. Map Reading, American Military History, Leadership, Drill and Command. Prerequisites: Military Science 11, 12 and 13 or 24. Two class periods and one leadership laboratory period per week. (2F) Staff

22. Military Science II. Continuation of Military Science 21. American Military History; Map Reading and Aerial Photography; Operations and Tactics. Leadership Drill and Command. Two class periods per week. (2W) Staff

23. Military Science II. Continuation of Military Science 22. American Military Science; Operations and Tactics; Leadership, Drill and Command. Two class periods and one leadership laboratory period per week. (2S) Staff
Advanced Military Science
MS III—First Year Advanced
DIRECTOR: Captain J. D. Smith

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) Smith

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) Smith

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) Smith

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) Smith

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) Staff

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) Staff

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) Staff

145. Military Science IV Flight. An FAA-approved standardized flight program of instruction consisting of 35 hours of ground instruction and 36½ hours of flight instruction. Three additional hours are granted to meet unforeseen contingencies. Prerequisite MS IV or completion of ROTC program; meet Army flight physical requirements. (3F, W, S) Smith

Seminars

174. Advanced Military Science Seminar Problems. Prerequisite: Enrollment in or completion of Advanced Military Science. Credits arranged. (F, W, S) Staff

201. Advanced Military Science Seminar Problems. Prerequisite: Graduate standing. Credits arranged. (F, W, S) Anderson
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School of

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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 Arts, T. Y. Booth; College of Science, 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. Students must be approved by the department in which they propose to work.

If the student cannot qualify for the degree program in a particular field, he 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 the major department must be taken as soon as possible after registration. The results of these examinations become a part of the student’s file in the Graduate office. If found to be deficient in the work basic to the field in which he proposes...
to study, he may be required to take undergraduate courses—which do not count in the minimum requirements for the advanced degree—to satisfy the deficiency.

Supervisory Committee. When it has been determined that a student is acceptable as a possible candidate for a higher degree, the major professor will suggest a committee to assist in guiding his program and in conducting necessary additional qualifying examinations and the final examination. When the program has been determined and approved by the committee, he will be advanced to candidacy for a degree. Advancement to candidacy must be accomplished before the end of the winter quarter if one plans to graduate at the following Commencement. When research is best supervised by a federal collaborator, or other person who is not a member of the regular teaching staff, such collaborator or other person may be designated as thesis director. This thesis director is a member of the student's committee.

Thesis or Dissertation. A candidate for an advanced degree usually must present a thesis or dissertation on the topic within the field of his major subject, which must represent from nine to fifteen hours of the credit presented for the master's degree, and as much as forty-five hours of credit for the doctor's degree. The thesis must be a contribution to the field of knowledge, based upon the student's own research or a treatment and presentation of known subject matter from a new point of view. After final approval by the department, the thesis must be typewritten in standard form; and a copy must be submitted to each member of the advisory and examining committee at least two weeks before the date of final examination. After approval by the committee and the department, and after successfully passing 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 the student.

Microfilming of Thesis. Students pay for microfilming their thesis, and the films are deposited in the University library. For master's candidates, the fee is five cents per page and students may obtain their 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 working under "Plan B" in general agriculture, the dean of the College of Agriculture will select a major professor to be the chairman of the student's supervisory committee. This program must include a minimum of six credits each in the fields of Plant Science, Animal Science, and Agricultural Economics.

Credit Load. 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 properly registered in the School of Graduate Studies any course in the 100 series is recorded as graduate credit. If in education and interested in recertification students should be sure they 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. The 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. A candidate for a Master of Science degree is required to pass a comprehensive final examination on the subjects of graduate study and on his thesis. This examination may be oral or written or both as the committee decides, and is open to all faculty members and officials of the School of Graduate Studies. Arrangements for the time and place of the examination are made by the Dean of the School of Graduate Studies. A member of the advisory and examining committee, other than the major professor, or 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 a student is to receive his 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 the 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 graduate work is being done. Credit toward a Master's degree is not granted for Home Study (correspondence) Courses.

Transfer Credit. A maximum of nine quarter credits of graduate work satisfactorily completed at
another approved Graduate School may be allowed toward a Master's degree. The extent to which such credit may reduce either the course or the residence requirements will be determined by the committee.

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 specific needs. This degree emphasizes 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 the 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 Master's Paper. 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 Master's Paper, 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 competence in an area of specialization in education plus a thorough development of skills and knowledge of the broad field of education and in
School of Graduate Studies

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.


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 the student's needs. Requirements of a second language will be optional with the department in which he takes his major. Proficiency in using the required language in the chosen field and 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 work, to determine 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 the student would graduate. The dissertation must show ability to do critical and independent research. It must present a contribution to knowledge in scholarly fashion.

Final Examination. The final examination in defense of dissertation will be conducted by the supervisory committee 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 the Master's degree in two years.


Fellowships

University Research fellowships carry a stipend of $2,000 and the remission of non-resident tuition. The student is required to participate successfully in a research project leading to a Master's thesis or Doctor's dissertation. These are tenable in any field in which USU grants an advanced degree. Application must be made by February 1, and awards are made April 1.

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, 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 $1,800 for a tenure of nine months, and $2,400 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

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, spectrophotograph, 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 concerning admissions, requirements, and available scholarships and fellowships write the curriculum chairman.

### Master's Degree Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Advanced Nutrition</td>
<td>10</td>
</tr>
<tr>
<td>2. Advanced Biochemistry</td>
<td>10</td>
</tr>
<tr>
<td>3. Statistics</td>
<td>8</td>
</tr>
<tr>
<td>4. Physical Chemistry (Biology)</td>
<td>3</td>
</tr>
<tr>
<td>5. Electives and Research</td>
<td>14-17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>45-48</strong></td>
</tr>
</tbody>
</table>


Doctorate Degree Requirements

1. Advanced Nutrition .......................... 12
2. Advanced Biochemistry .......................... 15
3. Statistics ...................................... 12
4. Physical Chemistry (Biology) .................. 3
5. Physiology, Zoology, Pathology .............. 20
6. Electives and Research ....................... 73

Total ............................................. 135

Chairmanship for the curriculum rotates each year: chairman for 1962-63 is Lorin E. Harris.

Inter-Departmental Curriculum in

Plant Nutrition and Biochemistry

Facilities of the various departments conducting research in plant nutrition and biochemistry have been made available for this program. This includes plant growth chambers, laboratories equipped with equipment such as an electron microscope, ultracentrifuge, refrigerated centrifuges, spectrophotometers for ultra violet, infrared, visible, fluorescence and recording studies, chromatography equipment, Warburg apparatus, scaling and counting meters, electrophoresis apparatus and general laboratory equipment.

Prerequisites for a major in this curriculum 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

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany and Plant Pathology</td>
<td>3-5</td>
</tr>
<tr>
<td>1 course (116, 117, 118, 125, 130, 150)</td>
<td>3-5</td>
</tr>
<tr>
<td>1 course (121, 224, 225, 226)</td>
<td>3-4</td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
</tr>
<tr>
<td>2 courses (295, 296, 297)</td>
<td>6</td>
</tr>
<tr>
<td>Instrumental analysis 153</td>
<td>4</td>
</tr>
<tr>
<td>Physical Chemistry 101</td>
<td>3</td>
</tr>
<tr>
<td>Seminar</td>
<td>2</td>
</tr>
<tr>
<td>Zoology</td>
<td></td>
</tr>
<tr>
<td>Genetics 112 or Cell Physiology 130</td>
<td>5</td>
</tr>
<tr>
<td>Research</td>
<td>Maximum 15</td>
</tr>
</tbody>
</table>

Doctorate Degree Requirements

(in addition to those listed for M.S. program)

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany</td>
<td></td>
</tr>
<tr>
<td>2 courses (224, 225, 226)</td>
<td>6-7</td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
</tr>
<tr>
<td>Physical Chemistry 104, 105, 106</td>
<td>9</td>
</tr>
<tr>
<td>1 course (295, 296, 297)</td>
<td>3</td>
</tr>
<tr>
<td>Instrumental analysis 273</td>
<td>3</td>
</tr>
<tr>
<td>Physics</td>
<td></td>
</tr>
<tr>
<td>1 course (140, 143)</td>
<td>3</td>
</tr>
<tr>
<td>Seminar</td>
<td>3</td>
</tr>
<tr>
<td>Research</td>
<td>Maximum 45</td>
</tr>
</tbody>
</table>

Chairmanship for the curriculum rotates each year; current chairman is Herman H. Wiebe.
Summer School
Summer School

Office in Agricultural Science 4

Two Summer School sessions of five weeks each will be conducted at Utah State University in 1962. The offerings include a rich program for both graduate and undergraduate students. Opportunities for professional advancement are provided for school administrators, supervisors, elementary and secondary teachers, guidance counselors and people in the various professions.

It is possible to attend one or combine two five-week terms for a quarter's work. By attending three full summer sessions a student may accelerate his undergraduate program one complete year. A graduate student may complete requirements for a Master's degree in three summers. High school graduates may begin their college career in the summer quarter.

The resident faculty will be augmented by visiting teachers and lecturers of national reputation. The instructional services of the University are organized into eight academic colleges: Agriculture; Business and Social Sciences; Education; Engineering; Forest, Range, and Wildlife Management; Family Life; Humanities and Arts; Science; also a School of Graduate Studies.

The Summer School has prepared a varied and stimulating program of offerings including: formal courses, workshops, conferences, lectures, concerts, dramatics, musical activities and recreation. A student may profitably spend a one, two, five, or ten-week period for professional, cultural and recreational enrichment.

The climate of Logan, its scenic canyons, and nearby national parks and monuments makes Utah State University Summer School an ideal institution for study, recreation and vacation.

A 1962 Summer School Catalog will be mailed 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 eight 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 and by the National Council for Accreditation on Teacher Education.

Campus and Facilities. The main campus of CSU consists of 60 acres of land and 25 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. A student 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.

For Information. A special catalog for CSU is issued each year.
276 Branch Colleges

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 completion of a two-year college program. Students who follow terminal curricula are awarded a two-year certificate of completion.

Curricula. Snow College is authorized to teach lower division courses in all basic areas of instruction.

Courses offered at Snow College parallel lower division courses offered at Utah State University. Course numbers generally coincide with those listed at Utah State University. A student may complete all lower division requirements at Snow College and transfer to Utah State University for completion of upper division work. Course instruction is offered in divisions and departments which correlate with lower division work in the academic colleges on the Logan Campus.

For Information. A special catalog for Snow College is issued each year. It contains a detailed announcement of all curricula, statement of courses, entrance requirements, rules and 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 William H. Bennett; ASSISTANT DIRECTOR J. Clark Ballard1; SUPERVISOR, AGRICULTURAL PROGRAMS Leon C. Michaelsen; STATE 4-H CLUB LEADER Glenn T. Baird; ASSISTANT STATE 4-H CLUB LEADER Amy R. Kearsley; SOCIAL AND ECONOMIC LEADER Stephen L. Brower; DISTRICT DIRECTORS Gordon L. Beckstrand, Marden Broadbent, 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 Lloyd Clement; HOME MANAGEMENT AND HOME FURNISHINGS SPECIALIST Rhea H. Gardner; HORTICULTURE AND VEGETABLE CROPS SPECIALIST Anson B. Call; INFORMATION SPECIALIST Cleon M. Kotter; ASSISTANT INFORMATION SPECIALIST Thomas Jones; IRRIGATION SPECIALIST Terrel Tovey; LIVESTOCK MARKETING SPECIALIST Morris H. Taylor; NUTRITIONIST Elma Miller; POULTRY SPECIALISTS C. Elmer Clark, C. I. Draper; RADIO AND TELEVISION SPECIALIST Arthur L. Higbee; RANGE MANAGEMENT AND FORESTRY SPECIALIST John F. Valentine; RECREATION SPECIALIST Clayne R. Jensen; SHEEP AND WOOL SPECIALIST Russell Keetch; SOIL CONSERVATIONIST Paul D. Christensen; VETERINARIAN Don W. Thomas; WILDLIFE SPECIALIST Jack H. Berryman.

County Agricultural Agents
BEAVER Grant M. Esplin1; Kent Dewsnup; BOX ELDER A. Fullmer Allred, Ray H. Finch; CACHE Lamont E. Tueller, G. Ray Burtsenshaw; CARBON Robert L. Hassell; DAVIS L. Darrell Stokes, Leki S. Rogers; DUCHESNE William L. Smith; EMERY Gerald R. Olson; GARFIELD Harold G. Lindsay; IRON Wallace D. Sjoblom; JUAB Kay R. Bendixson1, Lynn M. Esplin; KANE Carl Hatch; MILLARD Rodney G. Rickenbach, Marven J. Ogden; MORGAN Ray A. Thater; PIUTE Rulon W. Buck; RICH Wesley T. Maughan1; ROOSEVELT Norris J. Stenquist; SALT LAKE Joseph R. Parrish, D. Wayne Rose; SAN JUAN Reel F. Argyle; SANPETE C. Dennis Funk; SEVIER Paul K. Grimshaw; SUMMIT J. Reed Moore; TOOELE Ernest O. Biggs; UINTAH William F. Farnsworth, Ben W. Lindsay; UTAH Clair R. Acord, Joel C. Barlow; WASATCH Paul R. Daniels; WASHINGTON Don A. Huber; WAYNE Jay M. Hall; WEBER Melvin S. Burningham, Fay W. Boyer.

County Home Agents
BEAVER Sofia Ann Yardley; BOX ELDER Jessie Eller; CACHE Bessie K. Lemon; CARBON Clara Schofield; DAVIS Karma P. Swindle; GARFIELD Flora H. Bardwell; IRON Mabel Merril; JUAB Velyn B. Stevens; MILLARD LaVell W. Turner; MORGAN Margaret Hall; PIUTE Ruth D. Coates; RICH Helen J. Wamsley; ROOSEVELT Mary Boender; SALT LAKE Bernice Palfreyman, Carolyn Dunn; SANPETE Sarah S. Tuttle; SEVIER Beth S. Bastian; SUMMIT Naomi Jensen; TOOELE Elizabeth Darley; UINTAH Dorothy Wach; UTAH Emily W. Tyler; WASATCH Paul R. Bacon; WASHINGTON Mary K. Purdy; WEBER Maud Martin, Ruth Tippetts.

1On leave.
Extension Services

William H. Bennett, 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, 24 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 development; (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
Extension Services

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.

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.

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 Admissions and Records Office two weeks prior to the day of graduation.

An enrollee is allowed one year in which to complete a course. An extension of time may be granted upon payment of a small fee.

**USAFI Courses.** USU is cooperating with the United States Armed Forces Institute (USAFI) 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 GI Bill of Rights. If an individual desires Home Study courses he should first contact the local Veterans Administration regional office and determine whether he is still eligible to continue schooling under the GI benefits, and if so, determine what procedures he 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 an individual is interested in Home Study courses, he may request a Home Study Catalog, which contains full information concerning this program.
Information Services
Information Services


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 by 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; Crucible, 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.
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Research Programs

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Research Programs


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 136

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. Pres-
288 Research Programs

D. Wynne Thorne, Research Division.

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. Investigations during the past several years have demonstrated that teaching machines can be an effective aid in the learning process. A current project proposes to produce an improved and more versatile teaching machine. Another study is being carried out to determine the merits and proper place of summer schools in secondary education in Utah.

Literature and Arts: Staff members in these areas are assisted in carrying out scholarly, creative programs. One study is concerned with a poetic interpretation of the Book of Genesis. In another, access is had to a large volume of unpublished writings and correspondence of Jack London. Through this is provided a better interpretation of the contributions of Jack London to the process of social revolution. Printmaking is being developed as a special form of artistic expression. A comprehensive collection of cowboy ballads recorded from individuals throughout western United States is being edited and annotated for publication.

Biological Science: Emphasis is being placed this year on developing a new area of research on the biochemistry of gene action. This will be in association with continuing studies on fruit flies and their tumorous traits. Another important activity is the collection of plants from the Intermountain Region, the maintenance of the Intermountain Herbarium, and the publication of a comprehensive description of the flora of this region. New equipment is being utilized to study the behavior of birds and record 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. 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: 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 elec-
tronic 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. Special emphasis is being placed on research on recreation in relation to the use of forests and other land and water resources. A cooperative program on recreation with the U.S. Forest Service is under way.

Agricultural Experiment Station

D. Wynne Thorne, Director

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 and Computer Science, Bacteriology and Public Health, Botany and Plant Pathology, Chemistry, Civil and Irrigation Engineering, Dairy Industry, Foods and Nutrition, Forestry, Horticulture, Poultry Husbandry, Range Management, Sociology, Veterinary Science, Wildlife Resources, and Zoology. The staff includes about 45 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 poul-
try; 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 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 Sciences 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**, located five miles south of Logan near College Ward, to the east of Highway 89. Approximately 230 acres of excellent land have been purchased. When the buildings and other facilities are constructed, most field research on sheep, beef cattle, and swine will be moved there from the present location to the north of the campus.
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, in cooperation with Agricultural Research Service, maintains an experimental Holstein-Friesian and Jersey dairy herd of about 200 mature purebred animals. Research in this division includes pasture improvement investigations, and feeding, breeding and management studies.

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 principle 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 a 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 300 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.
Engineering Experiment Station

Dean F. Peterson, Dean, College of Engineering
Vaughn E. Hansen, Director, Engineering Experiment Station

Office in Engineering and Physical Science C210

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 supervisory 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.

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 of 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 marshlands** 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.

**New ultrasonic methods** are being developed for measuring sediment size and concentration in streams.

**Improved techniques for electrofishing**, 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; W. Karl Somers, 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 Industrial Education, 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 microfilmed 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.

Utah Cooperative

Wildlife Research Unit

Jessop B. Low, Leader

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.

Utah Cooperative

Fishery Research Unit

Donald R. Franklin, Leader

Office in Forestry 303

A Utah Cooperative Fishery Research Unit was established at USU January 1, 1962, to conduct sport fishery training and research.

It is the first of several such units contemplated in selected states.

Objectives of the program include teaching, training of fishery scientists, management surveys and research related to problems of regional or national interest.

Cooperating in the unit are USU, with its Department of Wildlife Resources; the Bureau of Sport Fisheries and Wildlife, U.S. Department of the Interior; and Utah State Department of Fish and Game.

It will share facilities and services of the Utah Cooperative Wildlife Research Unit, which operates on a similar basis.

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.
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Student Services and Activities

DEAN OF STUDENTS Claude J. Burtenshaw
DEAN OF WOMEN Leah Dunford; COORDINATOR OF STUDENT ACTIVITIES Evan Stevenson; COORDINATOR OF STUDENT HOUSING William W. Skidmore; COORDINATOR, COUNSELING AND TESTING E. Wayne Wright; CHAIRMAN, STUDENT HEALTH SERVICES Gus W. Neece; CHAIRMAN, STUDENT EMPLOYMENT PLACEMENT C. D. McBride; CHAIRMAN, STUDENT LOANS Reese Murray; CHAIRMAN, SCHOLARSHIPS, AWARDS, AND HONORS John R. Williams.

Office in Main 133

The program of student services is designed to assist in effective adjustment 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; orientation activities; 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 assistance 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 should provide opportunities for religious education.

LDS, Protestant, and Catholic churches offer courses in religion for USU students. Credit can be received 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 the 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. They are encouraged to affiliate with the church of their 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 at home must live in University-supervised housing. In rare in-
Student Services and Activities

stances, 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 partment-Living Residence Halls will accommodate six women in an apartment. Accommodations consist of combination living-room-kitchen, bath, and three bedrooms. Living-room-kitchen is equipped with electric refrigerator, electric range, table, chairs, and draperies. 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 be installed if desired, also on a share-the-expense basis. Rent is $70 per person per quarter. Living rooms, recreation and sewing rooms, sundecks, 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 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 per quarter.

An apartment type residence hall accommodates 144 men. An apartment consists of a living-room-kitchen combination, a bathroom, and three large bedrooms. The living-room-kitchen combination is equipped with an electric refrigerator, built-in electric range, table, chairs and draperies. Cooking utensils, dishes, towels, linen, irons, ironing boards and all other personal effects are furnished by the renters. Cost of electricity and telephone expenses are shared by the six men in the apartment. Rent for one quarter is $70 per person.

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 furnished. Cost of $210 per person per quarter covers board and room charges. Cost of room without board is $85 per quarter.

Sorority Houses provide board and room for their members and are managed by their own officers. Each has a University-approved housemother in a supervisory capacity. Rates are determined by the house manager and compare favorably with other living rates on campus.

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 $55 per person per quarter. Other utilities are not provided.

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 $40 to $44 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.

Seventy-two new two-bedroom apartments for married students are located at 10th North and 12th East. Monthly rental charge is $62.50. The tenant pays for electricity and heat in addition. These apartments include electric refrigerator and range, and drapery on the living room window. All other furnishings must be provided by the tenant. No television antennas will be permitted on the roof.

University Trailer Court, located on the corner of 12th East and 11th North, provides modern trailer connections to sewer and water mains. Students are encouraged to bring private trailers. These must be modern, sanitary trailers. Parking space is hard surfaced. A Utility house provides laundry space, 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.

LDS Student Living Center

The LDS Student Living Center is composed of seven apartment buildings—four for women and three for men. They are designed as family-living units with six students in an apartment, and are located on the corner of 12th East and 10th North. Charges will be comparable to University housing. The units will house 288 women and 216 men. Address all inquiries and applications to C. Don Bishop, Mgr., LDS Student Living Center, University Hill, Logan, Utah.

Off-Campus Housing

The Office of Student Housing maintains lists of accommodations for students in private homes. Many apartments, rooms, board and room, and boarding 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.

Students desiring off-campus housing may procure the current housing list upon arrival at the University, Room 130, Main Building.
Student Services and Activities

Application for Housing

Prospective students are invited to direct inquiries and requests for application to Co-ordinator of Student Housing, Utah State University, Logan, Utah. Upon request, an application form will be furnished. This application should then be completed and returned with the $25 application fee. Priority lists are based on date of application.

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 Service

Food service is obtainable in the University Cafeteria located in the Student Union Building on campus.

Awards, Honors, Scholarships and Grants-in-Aid

The University offers a variety of scholarships and awards. Some of these are actual money grants in varying amounts, others provide for registration and tuition fees to be waived. The latter kind generally come under the classification of tuition scholarships.

The primary purpose of the tuition scholarships is to assist new students who have high scholarship and financial need in becoming established in college. These scholarships are discussed in greater detail under the section of Scholarships and Grants-in-Aid for new students.

Most of the scholarships which consist of actual money grants are reserved for students who have been attending Utah State University for at least one year and preferably two years or more. These are usually given at the Awards and Honors Convocation which is held early in May of each year. Students who are interested in 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)

All Colleges

The Lieutenant Clyde Parker Baugh Memorial Fund, a gift of Mr. and Mrs. Wilford F. Baugh, provides four scholarships annually for deserving students of high scholarship and leadership.

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.

Faculty Women's League Scholarship Award of $100 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.)

The Johansen Scholarship Fund, a gift of the late Mrs. Johanna Johansen, provides scholarships annually, worth in the aggregate from $125 to $150, for help of worthy students of junior and senior rank.

Phi Kappa Phi Scholarship. A $100 cash award given to a sophomore student of high scholarship and outstanding character.

Rhodes Scholarships. Candidates for Rhodes Scholarships at Oxford University, England, are selected each year from Utah. High scholarship and some definite quality of distinction, whether in intellect, character, or personality, or in any combinations of these, are the most important requirements. Seniors or graduate students are generally chosen as candidates. It is suggested, however, that students would do well to be preparing for the candidacy in earlier years. Information and application blanks may be obtained from the University representative, Rhodes Scholarship Committee.

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.

College of Agriculture

4-H Scholarship offered by Alpha Gamma Rho. The National fraternity of Alpha Gamma Rho offers annually, a cash scholarship of $200 to be applied toward a full term course at any suitable accredited college of agriculture. The National 4-H Awards Committee has sole responsibility for selection of the winner from among the candidates nominated by the State 4-H Club Leaders, such selection to be on the basis of scholarship, achievement and demonstrated need. Further information may be secured from Alpha Gamma Rho Fraternity, 706 West Michigan Avenue, Urbana, Illinois.

FFA Scholarship offered by Alpha Gamma Rho. The National Agricultural fraternity of Alpha Gamma Rho offers annually a cash scholarship of $200 to be applied toward a full term course at any suitable accredited college of agriculture. The American Vocational Association has sole responsibility for selection of the winner from among candidates nominated by the State Supervisors of Agricultural Education, such selection to be on the basis of scholarship, achievement and demonstrated need. Further information may be secured from Alpha Gamma Rho Fraternity, 706 West Michigan Avenue, Urbana, Illinois.

Borden Agriculture Scholarship. A scholarship of $500 to a senior in Agriculture who has completed two or more courses in Dairy Industry and has achieved the highest average grade among the students in Agriculture in all college work preceding the senior year.

Jenkin Jones Memorial Scholarship. An award of $500 given to an outstanding upper division student in Agronomy. Available for school expenses the following year.

Ralston Purina Scholarship. A scholarship of $500 given in recognition and assistance to an outstanding junior in Agriculture for use in his schooling the senior year.

Sears- Roebuck Foundation Scholarships for Freshmen. Thirteen scholarships of $300 each are given annually to outstanding high school graduates of Utah who enroll to major in Agriculture at Utah State University. Available for school expenses the freshman year.

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.
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Sears-Roebuck Foundation Scholarship For Sophomore. A scholarship of $300 to a student in agriculture who, among the recipients of the Sears-Roebuck Awards for freshmen, had the highest grade point average the freshman year. Available for school expenses the sophomore year.

College of Business and Social Sciences

O. Guy Cardon and M. N. Neuberger Scholarship in Social Science. The Bluebird Candy Company at Logan offers a scholarship in the social sciences: economics, history, political science, and sociology, in honor of the late O. Guy Cardon and of M. N. Neuberger. Applicants majoring in the fields indicated should contact the Dean of Business and Social Sciences.

Harry E. and Vera F. Carleson Scholarship in Economics. Two $200 scholarships given to outstanding junior or senior students majoring in economics.

Clark Tank Line Transportation. A scholarship made available to a student studying or planning a career in the motor carrier transportation field.

First Security Foundation. Two scholarships of $500 each, one awarded to a student of business and finance and the other to a student in agriculture, both at the end of their sophomore or junior year from either the sophomore or junior class.

Joseph A. and Grace W. Geddes Scholarship. Limited to graduate students in sociology. Made up of funds contributed by the Utah Cooperative Association and students and friends. Annual stipend $200. The Sociology staff supervises the funds by adding to it earnings and donations, aiding students to select projects useful to society, and supervising studies.

Cache Valley Cooperative Scholarship. This scholarship is limited to graduate students in the Departments of Sociology, Agricultural Economics and Dairy Industry. A thesis on some phase of cooperation is involved. For information inquire from the chairman of department involved.

Louise Y. Robinson National Woman's Relief Society Scholarship. 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.

The Eric W. Ryberg Memorial Scholarship in Commerce, sponsored by Eric C. and Maridean M. Ryberg, is awarded annually to a junior, senior or graduate student in the 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.

College of Engineering

The American Society of Tool Engineers. Two $100 Scholarships are awarded to engineering students who show interest, ability and scholarship in pursuing tool engineering curriculum. Donors are Eimco, and McGhee-Hogan Machine Works, Salt Lake City. Application should be made to the Salt Lake City Chapter, 85, or the Tool Engineering Department, USU, not later than February 10, each year.

Associated General Contractors Scholarship. 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.

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 E. O. Larson Scholarship. The E. O. Larson scholarship in Irrigation Engineering of $200 is awarded annually to a senior or graduate student in the College of Engineering, majoring in civil and irrigation engineering. The award is made on the basis of scholarship, with outside work activities considered, personal interest in and adaptability to the field and personal need.
Eric W. Ryberg Scholarship. A grant of $200 from the Utah Sand and Gravel Company is made to a student in Civil Engineering selected by a special committee. Application should be made to the Dean of the College of Engineering by December 1.

Socony Oil Company Scholarship. A $500 scholarship to a mechanical engineering student on the basis of scholarship, need, and ability as an engineer.

Western Electronic Manufacturers Association Scholarship Awards. Several WEMA scholarship awards are made each year to Electrical Engineering students based on high scholarship and need. The amounts will be from $150 and up depending on the annual WEMA grant to USU.

College of Family Life

Greaves Memorial Scholarships. Two $75 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 Scholarship. Two $125 awards in memory of Johanna Moen given to worthy students in the College of Family Life who show outstanding aptitude in the field.

The Phi Upsilon Omicron Scholarship 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.

College of Humanities and Arts

Deseret News and Salt Lake Telegram Professional Internship. The News and 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.

Wrigley English Scholarship. The Robert L. Wrigley family presents two scholarships annually to English majors in memory of Mrs. Wrigley. One $175 scholarship is given to an outstanding student of sophomore standing, and one $225 scholarship is given to an outstanding student of junior rank.

English Department Scholarship. The English Department awards annually one $150 scholarship to an outstanding student who has completed his freshman year at USU. He must be an English major.

Scholarships and Grants-in-Aid (Primarily for new students)

The University grants annually scholarships covering from one to three quarters’ tuition each on the basis of outstanding academic ability or demonstrated ability in the areas of speech, drama, music, art, athletics, commercial training, and other academic subjects. Tournament and contest winners frequently receive these awards.

The University also awards grants-in-aid to help deserving students who have economic need.

To be eligible for a grant-in-aid, a student must meet either of the following requirements:

1) A freshman must have been academically rated as in the upper two-thirds of his high school graduating class. For the first year such award shall be made on an annual basis.

2) A student, other than a freshman, must be in good academic standing and not on probation. Such award shall be made on a quarterly basis.

All of the above awards are under the jurisdiction of a Scholarship, Awards and Honors Committee, which alone has the authority to promise or grant an award. All applications for grants-in-aid or scholarships should be made to the chairman of this committee.
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All scholarships and grants-in-aid must be applied toward the payment of tuition or fees.

Any scholarship or grant-in-aid may be withdrawn at any time for academic or other good and sufficient reasons, if, in the judgment of the Dean of Student Services, the recipient has clearly demonstrated his failure to comply with both the spirit and the letter of the original terms of the scholarship or grant-in-aid.

Tuition Scholarship. The President of the University is authorized by Title 53, Chapter 34, Section 1-a, Utah Code Annotated, 1953, to waive registration and tuition fees in full or in part for a limited number of meritorious or impious students whose domicile is in the state of Utah.

Faculty Women's League Annual Freshman Scholarship provides tuition for one year for a freshman woman. Selection is based on need, scholarship, and leadership.

Fine Arts Talent. The Intermountain Theatres and Utah State University Fine Arts Department sponsor a Fine Arts Film Festival. 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.

A Cache Valley Cooperative Scholarship of $7,000 bears interest at 6 percent, earning $420 annually. This scholarship is limited to graduate students in the Departments of Sociology, Agricultural Economics and Dairying. A thesis on some phase of cooperation is involved. For information inquire from the department head involved.

Joseph A. and Grace W. Geddes Scholarship. Limited to graduate students in Sociology. Present value $7,000, comprised of $2,000 contributed by the Utah Cooperative Association and smaller amounts from students and friends. Annual stipend $200. The Sociology staff supervises the funds by adding to its earnings and donations, aiding students to select projects useful to society, and supervising studies.

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, and Weber.

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.

The E. O. Larson Scholarship in Irrigation Engineering, of $200, sponsored by Mr. Larson, is awarded annually to a senior or graduate student majoring in Civil and Irrigation Engineering. The award is made on the basis of scholarship, with outside work activities considered, personal interest in and adaptability to the field and personal need.

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.

National 4-H Club Contests. National scholarships of $300 each are available to 4-H Club members in at least 22 different projects or activities.

Palmer Scholarships. Val W. Palmer scholarship fund gives ten scholarships of $100 each and are awarded each year to students of outstanding scholarship and leadership ability.

Woody B. Searle Scholarship. A tuition scholarship is awarded each year by Woody B. Searle to a needy and deserving graduate of the Uintah High School. Applications should be filed before April 15th with the principal of the U.H.S. at Vernal.

Sears-Roebuck Foundation Scholarship. Thirteen scholarships of $300 each are awarded annually by the Sears-Roebuck Foundation to freshmen in the College of Agriculture. Selection is made from graduating seniors of the high schools of Utah on the basis of interest in agriculture, scholarship, leadership, and financial need. The winner who has the best scholastic record at the end of his freshman year receives an additional scholarship for use in his sophomore year.
Sears-Roebuck Foundation Award in Home Economics. An award of $200 given to an incoming freshman student in the College of Family Life who has a high scholastic standing, leadership ability, and promise of achievement.

Standard Oil Scholarships. The Standard Oil 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.

Awards and Honors

William Alger Awards. A gold key is awarded annually by Alpha Epsilon Delta, pre-medical society, to the outstanding freshman pre-medical or pre-dental student. Scholarship, character and possibilities in medicine or dentistry represent the bases for the award.

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 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 Key Award. Alpha Kappa Psi Fraternity, Alpha Theta Chapter of which is established at Utah State University, awards annually the Alpha Kappa Psi Scholarship Medallion to the male senior in business with the highest scholastic average for three years of work taken in this University.

Alpha Lambda Delta Award to Senior Students. Book Award: An award to a senior woman who has been an Alpha Lambda Delta member and who carries the highest grade-point during her four years of college.

Alpha Zeta Award is made annually by Alpha Zeta fraternity honor society of agriculture and forestry students, to the sophomore in Agriculture or Forestry who made the highest scholastic record in his freshman year. The name of the winner is engraved upon a permanent trophy.

American Institute of Electrical Engineers Student Award. This award is made each year to the outstanding senior electrical engineering and AIEEE member. The award consists of one year's dues as associate member of AIEEE and a certificate of achievement.

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 American Rambouillet Sheep Breeders' Association Challenge Cup. To be presented each year to the student showing the greatest efficiency in fitting and showing Rambouillet sheep.

American Society of Agronomy Leadership Award. A plaque to the outstanding senior in Agronomy.

American Society of Civil Engineering Associate Memberships. Awarded annually to senior engineering students on the basis of scholarship, promise of success in engineering, personalty, and A.S.C.E. student chapter activity. The awards consist of associate membership in the American Society of Civil Engineers. The first is given by the Intermountain Section of A.S.C.E.; the second by the Civil Engineering faculty; and the third by the student chapter of A.S.C.E.

A.S.C.E. Membership Award. Junior 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.

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 class during the year of the award, and must have demonstrated a deep interest in furthering radio and television arts at Utah State University. Selection shall be made by the Director of Radio and Television at USU, the person directly responsible for the campus radio station, and Rey L. Barnes.

Blue Key Award. Each year Blue Key Honorary Service Fraternity awards a "Service
plaque" to an outstanding freshman or sophomore male student. Candidates are judged on University activities, scholarship, service to the University, and moral character. Application forms can be obtained from the organization and must be filed with the Blue Key Awards Committee on or before April 15.

Burpee Award in Horticulture. An annual award of $100 to the student in Horticulture who rates highest in scholarship, practical experience and interest in flower, vegetable and seed growing.

Cache Valley Chapter of the Utah State 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.

Cardon Jewelry Company Award. A Longines-Wittnauer watch to the most outstanding senior art student for the year.

Chemical Rubber Publishing Company Freshman Chemistry Award. The Chemical Rubber Publishing Company annually awards to an outstanding freshman in General Chemistry, a copy of its handbook of Chemistry and Physics.

Chemistry Faculty Award. The staff of the Chemistry Department annually awards a copy of the Handbook of Chemistry and Physics to the outstanding freshman student completing Chemistry 10 and 11.

Chi Omega Fraternity Award. 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.

Civil 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 the basis of scholarship, and promise of success in engineering. Selection is made by the Engineering Faculty.

Virginia Dare Award. A cash award of $25 to the outstanding junior in Dairy Manufacturing.

Danforth Foundation Home Economics Fellowships. The first is awarded jointly by the Danforth Foundation andRalston Purina Company to an outstanding junior in the College of Family Life. The award provides for two weeks' study of business problems in St. Louis, followed by two weeks of leadership training at the American Youth Foundation Camp on Lake Michigan. The second is awarded by the Danforth Foundation to an outstanding freshman in home economies. The award provides for two weeks' leadership training at the American Youth Foundation Camp.

Danforth Summer Award. Awarded to an outstanding freshman in Agriculture. This award covers the expenses of two weeks leadership training at the American Youth Foundation Camp on Lake Michigan. Transportation is up to the individual.

Danforth Summer Fellowships. Awarded to an outstanding junior in Agriculture. This award covers the expenses of two weeks marketing and research study at St. Louis and at the Purina Research Farm near by and two weeks leadership training at the American Youth Foundation Camp on Lake Michigan.

Delta Beta Chi Award. Ten dollars is awarded annually by the Delta Beta Chi Chemistry Fraternity to the freshman or sophomore chemistry student who writes the best essay on some subject in chemistry.

Distinguished Service Awards. Awards are given annually to outstanding students in theatre, music, library, and Physical Education.

Faculty Women's League Democracy Award is awarded to senior women. Candidates must have evidenced the best understanding of the democratic ideal in its application to University life, as exemplified by the following considerations: (1) Awareness of issues vital to university life, (2) individual responsibility for their solution, and (3) accommodation of individual interest to what seems to be the common good. (University award winner excluded.)

Farm Bureau Agricultural Leadership Award. An award of $200 to the senior who has exhibited the greatest measure of growth and excellence in scholarship, constructive organization and leadership in the College of Agriculture throughout his university course. The winner's name will be engraved on the Caine Leadership Plaque.

Foreign Student Achievement Award. A certificate of achievement to a graduating foreign student from a non-English speaking country who has the highest scholastic average during his undergraduate study.

The Hawaiian Steamship Company's Challenge Cup. Awarded each year to the student who shows the most proficiency in judging wool.
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**Science, student who shows the most proficiency in carried.** The grades of any quarter can be given to students who present evidence that Education and basic Military Science must be active quarters of their residence. At least used but once towards a Scholastic Award.

**Institute of Radio Engineers Award.** This award is made each year to the outstanding senior Electrical Engineer and IRE student member. The award consists of one year’s dues as associate member of IRE and a certificate of achievement.

**The John K. Madsen Challenge Cup.** Awarded each year to the student who shows the greatest proficiency in judging sheep.

**Mechanical Engineers Faculty Award.** An engineering handbook awarded annually to the mechanical Engineering senior with the highest grade point average. The award is made by the Mechanical Engineering faculty.

**Merck Award.** Merck and Company, manufacturing chemists, award annually a copy of the Merck Index to an outstanding student in organic chemistry and biochemistry.

**The Ogden Union Stockyards Challenge Cup.** Awarded each year to the student who shows the most proficiency in judging beef cattle.

**Rolla M. Rich Memorial Award.** An award of $50 to an outstanding student in agriculture in the upper division, who is active in the LDS Church.

**The ROTC Medal, a gift of the institution, is awarded each year to the student in Military Science and Tactics who most nearly represents the ideal that the Reserve Officers’ Training Corps is striving to develop, upon the following basis: (a) Character, 20 points; (b) Scholarship, 15 points; (c) University activity, 15 points; (d) Leadership, 20 points; (e) Aptitude for and interest in Military Science, 20 points; (f) Physique and bearing, 10 points.

**The Salt Lake Union Stockyards Company Challenge Cup.** Awarded each year to the student who shows the most proficiency in judging hogs.

**Scholarship A’s in the form of gold pins, are given to students who present evidence that their grades are all “A’s” for three consecutive quarters of their residence. At least fifteen credits exclusive of basic Physical Education and basic Military Science must be carried. The grades of any quarter can be used but once towards a Scholastic Award.

**Sigma Tau Award.** To the outstanding sophomore engineering student for scholarship, sociability and practicability. Selection made by the Alpha Delta Chapter of Sigma Tau, an honorary engineering fraternity.

**J. Fish Smith Award.** An award of $100 for the promotion of international relations, given to a foreign student in recognition of excellence in scholarship and contribution to international understanding and good will.

**Son of Paul Award.** Awarded to the graduating senior in the College of Forest, Range, and Wildlife Management, who has maintained a high academic record and shows promise of achieving outstanding professional success.

**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.

**United Business Education Association.** An award presented by the Smead Manufacturing Company to the senior who has distinguished himself in business education.

**A University Award** 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, and 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).

**Utah Association of Certified Public Accountants.** An award for the purpose of stimulating interest to the Outstanding senior student majoring in accounting.
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Utah Feed Manufacturing and Dealers’ Association Award. An award of $100 to an outstanding senior with a major in some phase of Animal Industry, preferably one interested in animal nutrition.

Utah Society of Professional Engineers. An annual presentation of certificate of merit to the outstanding senior engineering student at USU.

The Utah State University Science Medal. A gift of the late Director Emeritus William Petersen, is given each year to the student writing the best review of recent scientific research in either mathematics, physics, chemistry, geology, zoology, botany or astronomy.

Wall Street Journal Award in Business. A medal and one year’s subscription to the Wall Street Journal for outstanding achievement in business administration.

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.

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 College 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 102, Old Forestry Building.

Counseling

In recognition of the fact that students are faced with many problems throughout their University career, a broad program of counseling services has been established to meet individual needs in making and maintaining satisfactory adjustments to the University and life.

Under the supervision of the Coordinator 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 a student the assistance he needs and desires, to help him make wise decisions regarding educational, vocational, and personal problems. Accordingly, at the time of admission to the University, a student is assigned a faculty adviser with whom he will meet and have opportunity to discuss his academic program. If living in a residence hall, a student is also invited to seek his residence counselor, who is in a position to assist with many types of problems or to refer the student to the person who can be of most help.

When problems require the help of specialized counselors, a student will be referred by faculty advisers,
teachers, residence counselors to the office of Coordinator of Counseling Services. One is also encouraged to request these counseling services directly through the counseling office whenever he has problems with which he 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 a student's 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 a student has not decided upon a course of study he is especially encouraged to seek such information and assistance.

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. 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 a student needs services not provided by the University he 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 student 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 students with the life and environment of the University community. Participation in these orientation activities is required of all new students at the beginning of each quarter. In addition to group meetings for instruction in traditions, policies and procedures, there are opportunities for 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.

Foreign Student Advisement

Students from outside the United States are provided personal counseling and assistance, in matters related to immigration procedures, through the office of the Foreign Student Adviser. All students from abroad must register with the Adviser, in Room 133 Main, at the beginning of each quarter, and must keep him informed concerning such matters as local address, change in student status, acceptance of employment, etc. Requests for extensions of visa, work permits, immigration certifications, and money exchange letters must be submitted through the office of the Foreign Student Adviser. Students are urged to consult frequently with
the Adviser, and to keep him apprised of their problems and special needs.

The attention of all students is directed to the International Club, a campus organization representing hundreds of students, members of the faculty, and community residents. The “I.C.” is truly international, boasting active membership from approximately forty nations, including Canada, the United States, South America, Asia, Europe, Africa, and the Middle East.

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 students with such personal affairs as marriage, foods, clothing and finance. The description of these courses is found in the departments offering them. They include: Preparation for Marriage and Family Relations, FCD 20; Early Childhood, FCD 67; Family Finance, HEM 155; Home Management, HEM 149; Principles of Nutrition, FN 24; Laboratory for Nutrition and Food Preparation, FN 24a; Basic Clothing Construction, CT 8; Clothing Selection for Men, CT 15; Art in Everyday Living, FL 5.
Student Activities

Students are encouraged to participate in one or more of the following activities, dependent upon their 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, Utah State University guides its intercollegiate program by the policies and regulations of this organization.

USU's physical facilities for intercollegiate athletics include Romney Stadium, with a 15,000 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, one 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, *Crucible; Blue Book*, the official student handbook which contains the Student Directory, available to 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-Television.** The University operates radio station KUSU-FM which broadcasts six hours of programs daily, prepared and broadcast by students. KUSU-FM is a member of the National Association of Educational Broad-
casters. Television studios on the campus are equipped to produce and record complete television programs which are broadcast by Salt Lake City stations. Students assist in all phases of television production.

(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 eight colleges, AWS president, three representatives of independent students, and an international representative chosen by the foreign students on campus. There are four ex-officio members: president of Panhellenic, president of Interfraternity Council, editor of Student Life, and president of Co-Orgs.

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.


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.
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**English.** English Club.

**Forestry.** Forester's Club, Forestry Wives, Xi Sigma Pi.

**Geology.** Geology Club.

**History.** Phi Alpha Theta.

**Home Economics.** Home Economics Club.

**Landscape Architecture.** Landscape Architecture Club.


**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 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. Utahoa Club.

**Social and Special Interest**

**Fraternities, 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, Theta Omicron Pi, Chi Omega, Delta Delta Delta, Kappa Delta, Sigma Kappa.

**Recognition and Honorary.** Alpha Sigma Nu, Sigma Xi, Sigma Phi Eta.

**Regional.** Bear Lake Club, Canadian Club, Dixie Club, Sudags, Weber, Arab Student Organization.


**Scholarship.** Phi Kappa Phi, Alpha Lambda Delta, Phi Eta Sigma.

**Service.** Blue Key, Circle K Club, Intercollegiate Knights, Spurs, Sponsors.

**Miscellaneous.** International Club, Dames Club, Human Relations Club, Independent Students Association.
Alumni Association and University Development
USU Alumni Association

Col. Joe E. Whitesides, President

J. Lyn Larson, Executive Secretary

Office in Student Union Building 208

Utah State University Alumni Association now numbers more than 28,000 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. (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 $5 annual installments.

Government. The governing power of the Association is vested in the Alumni Council, composed of 15 elected members and ex-officio members. The current president of the Senior class and the president of the Associated Students’ organization are both ex-officio members of the Council. The Alumni Executive Secretary is the official representative of the Association on campus. The President of the Alumni Association is a member of the Utah State University Board of Trustees, as provided by Chapter 5, Article 75-5-0, School Laws, State of Utah.

Function. The Alumni Association is the medium through which former students of Utah State are kept in contact and are served after leaving the campus. Efforts are made to maintain a complete record of every alumnus throughout life, and his accomplishments and progress are recorded. 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

J. Lyn Larson, Fund Director

Office in Student Union Building 208

A key part of USU’s Development program is a Development Fund, a non-profit corporation (established August 11, 1958), to encourage grants, bequests, and gifts of money, property, works of art, historical papers and documents, and museum specimens having educational, artistic or historical value. The Development Fund thus helps the University increase and improve its educational and other services.

A fifteen-man board of directors of this non-profit corporation represents five groups: USU Board of Trustees, Alumni Association, the University Administration and Faculty, the Associated Students and General Public.

Fund officers are: Rudy Van Kampen, chairman; J. K. Wheeler, vice-chairman; Dee A. Broadbent, treasurer; J. Lyn 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 foundations voluntary contributions to the University, and to establish such by-laws and policies as are necessary to carry out the purpose of the Fund; (3) to determine from time to time the methods of solicitation and publicity and to maintain the active interest of alumni and of the public in the Development Fund; (4) to elect and appoint such officers and committees and incur necessary expenses within its budget allowance as are needed for the proper accomplishment of its purpose; (5) to coordinate all University efforts relating to the Development Fund.
University Faculty
and Collaborators
Utah State University 1962-63 Faculty

CHASE, DARYL (1945) President; Professor. BA 1927 U of U, MA 1931, PhD 1936 U of Chicago.

ABRAMS, MILTON C. (1949) Librarian; Asso. Prof. of Library Science. BS 1948, MS 1952 USU.


ALLRED, A. FULLMER (1945) Asst. Prof., Extension Services; Box Elder Co. Agent. BS 1938 BYU.


ALLRED, J. R. (1958) University News Editor; Instr. in Journalism. BA 1950 U of U.

ALLRED, KEITH REID (1957) Asst. Prof. of Agronomy. BS 1951 BYU, PhD 1955 Cornell U.

ANDERSEN, LADELL (1961) Head Basketball Coach; Instr. in Physical Education. BS 1951 USU.

ANDERSON, BRUCE (1951) Asst. Prof. of Irrigation Engineering. BS 1950, MS 1954 USU.


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.

ANDERSON, WENDELL B. (1947) Asso. Prof. of Political Science. BS 1935, MS 1940 USU, LLB 1941 George Wash. U.

ARGYLE, RELL F. (1954) Asst. Prof., Extension Services; San Juan Co. Agent. BS 1940 USU.


ASHCROFT, GAYLEN L. (1961) Asst. Prof. of Agronomy. BS 1953, MS 1955 USU.


BACon, MARY R. (1948) Asso. Prof., Extension Services; Wasatch Home Agent. BS 1928 U of U.

BAGLEY JAY M. (1955) Asso. Prof. of Civil and Irrigation Engineering. BS 1952, MS 1953 USU.

BAHLER, THOMAS L. (1949) Prof. of Zoology, Physiology. BA 1943 C of Wooster, PhD 1949 U of Wis.

BAIRD, GLEN T. (1946) State 4-H Club Leader; Asst. Prof. BS 1953 USU.

BAKER, DORAN J. (1959) Asso. Prof. of Electrical Engineering. BSEE 1953, PhD 1956 U of U.

*BALLARD, J. CLARK (1959) Prof.; Asst. Director, Extension Services, BS 1947 USU, PhD 1950 Cornell U.

BARDWELL, FLORA H. (1950) Asst. Prof., Extension Services; Garfield Co. Home Agent. BS 1940 BYU.

BARLOW, JOEL C. (1946) Asst. Prof., Extension Services; Utah Co. Agent. BS 1938 USU.


BARNARD, JOHN J. (1936) Dairy Specialist and Asso. Prof., Extension Services. BS 1933 USU, MS 1939 U of Wis.

BARNES, REY L. (1960) Producer-Director, Television; Manager USU-FM Radio. BS 1960 USU.


NOTE: Date in parenthesis indicates year the person joined USU staff, not necessarily in present position.

*On leave.
BECKSTRAND, GORDON L. (1950) District Director-Richfield and Prof., Extension Services. BS 1950 USU, MS 1958, PhD U of Wis.


BELL, WILLIAM HAROLD (1924) Prof. of Business Administration. BS 1923, MS 1931 USU.

BENDIXSEN, KAY R. (1952) Asst Prof., Extension Services; Juab Co. Agent. BS 1941, MS 1952 USU.

BENNETT, JAMES A. (1945) Prof. and Head, Dept. of Animal Husbandry. BS 1940, MS 1941 USU, PhD 1957 U of Minn.

BENNETT, WILLIAM H. (1937) Director, Extension Services; Prof. of Agronomy. BS 1936, MS 1948 USU, PhD 1957 U of Wis.

BENSON, RUTH (1961) Instr. in Languages. BA 1955, MA 1959 BYU.


BEUTLER, G. LEON (1954) Asst. Prof. of Science. BS 1950, MS 1959 USU.

BEYERS, JOHN M. (1957) Asst. Prof. of Languages and Philosophy. BA 1949, MA 1953 U of O.

BIGGS, ERNEST O. (1944) Asst. Prof., Extension Services; Tooele Co. Agent. BS 1926 USU.

BISHOP, A. ALVIN (1946) Prof. of Civil and Irrigation Engineering. BS 1934, MS 1938 USU.

BLACK, THEREL R. (1950) Asso. Prof. of Sociology; Rural Sociologist. BS, BA 1939 BYU, MA 1941 Louisiana State U, PhD 1951 U of Wis.

BLAKE, JOSEPH T. (1956) Asso. Prof. of Veterinary Science. BS 1949 BYU, MS 1950, PhD 1955, DVM 1956 Iowa State C.

BLANCH, GEORGE T. (1934) Prof. and Head, Dept. of Agricultural Economics. BS 1930, MS 1931 USU, PhD 1941 Cornell U.

BLASER, LEROY A. (1952) Director of Information Services; Asso. Prof. of Education. BS 1936, MS 1944 USU, EdD 1955 U of Calif.

BLAYLOCK, MARILYN (1961) Instr. in Family and Child Development. BS 1957, MA 1962 BYU.


BOENDER, MARY (1960) Asst. Prof. of Extension Services; Roosevelt Co. Home Agent. BS 1933 USU.


BOOTH, THORNTON Y. (1953) Asst. to Dean, C of Humanities and Arts; Coordinator of Liberal Studies; Prof. of English. AB 1941 BYU, PhD 1951 Stanford U.

BORG, WALTER R. (1957) Prof. of Education. BA 1943 San Diego State C, MA, PhD 1948 U of Calif.

BOWDEN, JOAN C. (1960) Instr., Edith Bowen Laboratory School. BS 1942 USU.


BOYD, RICHARD H. (1962) Asso. Prof. of Chemistry. BS 1961 Ohio State U, PhD 1965 MIT.


BOYLE, WILLIAM S. (1945) Prof. of Botany. BS 1937 BYU, MS 1939, PhD 1943 U of Calif.


BREWER, COURTNEY H. (1960) Agricultural Research and Information Editor. BA 1950 BYU, MS 1953 USU.

BRILLANTINE, RICHARD (1961) Instr. in Landscape Architecture and Environmental Planning. BS (Forestry) 1951 Rutgers U, BS (Landscape) 1959 USU.


BRITE, J. DUNCAN (1939) Prof. of History. BA 1922 U of Wyo., MA 1924, PhD 1937 U of Chicago.
BROADBENT, DEE A. (1938) Vice President of Business Affairs; Prof. of Agricultural Economics. BS 1936 USU, MS 1938 U of Ill.

BROADBENT, MARDEN (1938) District Director—Provo and Prof., Extension Services. BS 1937 USU, MS 1951, PhD 1960 U of Wis.

BROWER, STEPHEN L. (1950) District Director—Salt Lake City and Prof., Extension Services. BS 1949, MS 1950 USU, PhD 1961 Cornell U.


BUCK, RULON W. (1949) Asst. Prof., Extension Services; Piute Co. Agent. BS 1948, MS 1953 USU.

BUDGE, PEARL S. (1947) Asst. Prof. of Education. BS 1927, MS 1956 USU.


BURGOYNE, DAVID A. (1921) Asst. to Director, Agri. Exp. Station; Prof. BS 1919 USU, MS 1937 U of Ill.

BURNETT, NOLAN K. (1958) Athletic Trainer; Instr. in Health Physical Education. BS 1950, MS 1958 USU.


BURTENSHAW, CLAUDE J. (1962) Dean of Students. BS 1946, MS 1948, PhD 1955 U of U.


CAINE, ANN M. (1943) Instr. in Library Science. BS 1945 USU.


CALL, ANSON B., JR. (1928) Asso. Prof. and Horticulture and Vegetable Crop Specialist, Extension Services. BS 1927, MS 1928 BYU.


CANNON, MELVIN C. (1947) Prof. and Head, Dept. of Chemistry. BS 1933, MS 1938 U of U, PhD 1941 Boston U.


CANNON, ORSON S. (1948) Prof. and Head, Dept. of Botany and Plant Pathology. BS 1935, MS 1937 USU, PhD 1948 Cornell U.

CARLISLE, JOHN C. (1937) Dean, C of Education; Prof. and Head, Dept. of Education. BS 1926 U of U, MA 1935, EdD 1938 U of Calif.


CARTER, DON C. (1948) Prof. and Head, Dept. of Family and Consumer Science. BS 1948, MS 1952 U of Wash.

CARTER, PEARL B. (1956) Asst. Prof. of Bacteriology and Public Health. BS 1948, MS 1950, PhD 1956 U of U.

CARTER, PEARL J. (1943) Asst. Prof. of Library Science. BS, MS 1948 USU.

CARTER, WINFRED O. (1961) Asst. Prof. of Civil and Irrigation Engineering. BS 1953 U of Maryland, MS 1959, PhD 1961 Stanford U.


CHAPIN, JEANNE CROCKETT (1961) Instr. in Library Science. BS 1945 USU.

CHATELAIN, JACK E. (1957) Asso. Prof. of Physics. BS 1947, MS 1948 USU, PhD 1957 Lehigh U.


CHILD, RAWSON D. (1948) Asst. Prof. of Tool and Manufacturing Engineering. BS 1949, MS 1953 USU.

CHRISTENSEN, PAUL D. (1954) Asso. Prof. of Agronomy; Soil Conservationist, Extension Services. BS 1937 BYU, MS 1948 USU, PhD 1950 Rutgers U.
CHRISTENSEN, RONDO A. (1957) Asst. Prof. of Agricultural Economics. BS 1954 USU, MS 1955, PhD 1957 Cornell U.


CHRISTIANSEN, JERALD E. (1946) Prof. of Civil and Irrigation Engineering. BS (AE) 1927 USU, MS (CE) 1928; CE 1935 U of Calif.


CLARK, C. ELMER (1952) Asst. Prof. of Poultry Husbandry; Poultry Specialist, Extension Services. BS 1950 USU, MS 1959 U of Maryland.

CLARK, CLAYTON (1937) Prof. of Electrical Engineering. BS (Physics) 1938 USU, EE 1947, PhD 1957 Stanford U.

CLAYTON, RUTH V. (1961) Instr. in Clothing and Textiles. BS 1947, MS 1953 USU.


COCHRAN, GEORGE W. (1948) Prof. of Botany and Plant Pathology. BS 1941, MS 1942 Kansas State C, PhD 1946 Cornell U.

COLE, LARRY S. (1939) Prof. and Head, Dept. of Electrical Engineering. BS 1940 U of U, MS 1945 USU, EE 1950 Stanford U.

COLLIER, ROBERT P. (1958) Dean, C of Business and Social Sciences; Prof. and Head, Dept. of Business Administration. BA 1942 Reed C, PhD 1955 Stanford U.

COOK, C. WAYNE (1940) Prof. of Range Management. BS 1940 Kansas State C, MS 1942 USU, PhD 1950 Texas A & M.

CORDON, WILLIAM A. (1956) Asso. Prof. of Civil Engineering. BS 1933 USU.


CULMSEE, CARLTON F. (1945) Dean, C of Humanities and Arts; Prof. of American Civilization. BS 1932 BYU, MA 1937, PhD 1940 State U of Iowa.


DAINES, SPENCER H. (1943) Act. Asst. to Dean, C of Engineering; Asso. Prof. of Civil Engineering. BS 1942 USU, MS 1950 Kansas State U.

DALBY, MAX F. (1957) Director of Bands; Asst. Prof. of Instrumental Music. AB 1942 BYU, MA 1950 San Diego State C.

DANIEL, T. W. (1944) Prof. of Forest Management. BS 1934, MS 1936, PhD 1942 U of Calif.


DARLEY, ELIZABETH (1954) Asso. Prof. of Entomology. BS 1941, PhD 1950 U of Calif.


DAVIS, LYNN H. (1952) Asso. Prof. of Agricultural Economics. BS 1949, MS 1953 USU, PhD 1961 Ore. State U.


DeHART, WILLIAM A. (1951) Asso. Prof. of Sociology. BS 1937 BYU, MA 1941 U of Minn., PhD 1950 U of Wis.


DEWEY, WADE G. (1956) Asso. Prof. of Agronomy. BS 1953 USU, PhD 1956 Cornell U.

DEWSNUP, HENRY KENT (1961) Instr., Extension Services; Beaver Co. Agent. BS 1961 USU.


DOBSON, DONALD C. (1957) Asst. Prof. of Poultry Husbandry BS 1954 USU, MS 1955 Cornell U.


328 University Faculty

DOWNS, LOIS (1949) Asst. Prof. of Health, Physical Education and Recreation. BS 1945, MS 1949 USU.

DRAKE, ELDON M. (1951) Asso. Prof. of Education. BS 1943 USU, MS 1949, PhD 1951 Iowa State C.

DRAPER, C. I. (1945) Prof. and Head, Dept. of Poultry Husbandry. BS 1939 USU, PhD 1943 Iowa State C.


DUNFORD, LEAH (1959) Dean of Women; Asst. Prof. of Business Education and Office Administration. BS 1956 SU, EdM 1959 Ore. State C.


EISENSTEIN, IZYDOR (1959) Asso. Prof. of Mechanical Engineering. BS 1940, Dipl. Ing. 1942 Israel Institute of Technology, Hafa.

ELICH, JOE (1946) Prof. of Mathematics. BS 1940YSU, MA 1945 U. of Calif.

ELLER, JESSIE (1954) Asst. Prof., Extension Services; Box Elder Co. Home Agent. BS 1940 USU.


ERICSON, SYLVAN (1928) Controller. BS 1928 USU.

ESPLIN, GRANT M. (1946) Asst. Prof., Extension Services; Beaver Co. Agent. BS 1943 USU.

ESPLIN, JAMES LYNN (1958) Instr. Extension Services; Juab Co. Agent. BS 1954 USU.


FINCH, RAY H. (1955) Asst. Prof., Extension Services; Box Elder Co. Agent. BS 1938 USU.

FINCHUM, W. ARNOLD (1961) Asst. Prof. of Electrical Engineering BS 1949, MS 1959 USU.


FLAMMER, GORDON H. (1958) Asso. Prof. of Civil Engineering. BS 1952, MS 1953 USU, PhD 1958 U. of Minn.

FLOYD, J. WHITney (1935) Dean, C of Forest, Range and Wildlife Management; Prof. and Head, Dept. of Forest Management. BS 1936 USU, MSF 1942 U. of Calif.

FOGELBERG, THELMA (1930) Prof. of Languages. BS 1929 USU, MA 1933 U. of So. Calif., PhD 1939 L’Universite’ de Paris, France.


FRANCE, EDWARD LeROY (1940) Asst. Prof. of Industrial and Technical Education. BS 1941, MS 1960 USU.

FRANDSEN, ARDEN N. (1936) Prof. and Head, Dept. of Psychology. BS 1927, MS 1929 U. of U, PhD 1932 U. of Minn.

FREDRICKSON, CARMEN (1945) Asso. Prof. of Sociology. BS 1922, MS 1935 USU, Social work certificate 1938 USU.


FULLER, PAULINE (1951) Asst. Prof. of Health, Physical Education and Recreation. BS 1939, MS 1953 USU.


FUNK, C. DENNIS (1958) Asst. Prof., Extension Services; Sanpete Co. Agent. BS 1953 USU.

GARDNER, DALE L. (1955) Adm. Asst. of Athletics; Instr. in Physical Education. BS 1953 USU.

GARDNER, ELDON J. (1949) Prof. of Zoology. BS 1934, MS 1935 USU, PhD 1939 U of Calif.

GARDNER, REID J. (1961) Instr. in Electrical Engineering. BS 1961 USU.

GARDNER, RHEA H. (1939) Home Management and Furnishings Specialist, Extension Services; Asso. Prof. BS 1938 USU, MA 1947 Cornell U.

GARDNER, V. D. (1927) Prof. of Business Administration. BS 1922 USU, MBA 1927 Harvard U.

GERBER, ROBERT K. (1943) Asst. Prof. of Horticulture. BS 1932, MS 1935, USU.


GOREFIEH, DAVID (1961) Asst. Prof. of Psychology. BA 1956 City C of New York, MA 1957, PhD 1962 Columbia U.

GREENWOOD, DELBERT A. (1946) Prof. of Biochemistry and Pharmacology. BS 1926, MS 1930 BYU, PhD 1946 U of Chicago.

GRIMSHAW, PAUL R. (1952) Asso. Prof., Extension Services; Sevier Co. Agent. BS 1948, MS 1949 USU.


GUNNELL, MERRILL H. (1947) Asso. Prof. of Zoology. BS 1930, MS 1948 USU.

HAILES, CHARLES W. (1949) Asst. Prof. of Industrial and Technical Education. BS 1948, MS 1963 USU.

HALL, JAY M. (1956) Asst. Prof., Extension Services; Wayne Co. Agent. BS 1947 USU.

HALL, MARGARET (1960) Instr., Extension Services; Morgan Co. Home Agent. BS 1960 BYU.

HAMMOND, DATUS M. (1936) Prof. and Head, Dept. of Zoology. BS 1932 USU, MA 1934, PhD 1936 U of Calif.

HAMMOND, ROBERT G. (1956) Asst. Prof. of Mathematics. BS 1948, MS 1952 USU.

HAMSON, ALVIN R. (1955) Prof. of Horticulture. BS 1948 USU, PhD 1952 Cornell U.

HANSEN, ARLEN L. (1957) University Photographer; Instr. in Photography. BS 1952, MS 1958 USU.

HANSEN, BASIL C. (1954) Prof. of Education. BA, MA 1933 BYU, EdD Stanford U.

HANSEN, BURRELL F. (1948) Chairman, Radio and Television; Coordinator of Broadcasting; Asso. Prof. of Speech. BS 1940 USU, MS 1942 Purdue U, PhD 1953 U of Minn.

HANSEN, VAUGHN E. (1949) Director of Engineering Experiment Station; Prof. of Civil and Irrigation Engineering. BS 1943, MS 1947 USU, PhD 1949 State U of Iowa.


HARDER, VIRGINIA H. (1966) Asst. Prof. and Head, Dept. of Homemaking Education. BS 1934 BYU, MS 1936 Iowa State C.

HARDY, CLYDE T. (1956) Asso. Prof. of Geology. BA 1943, MS 1948, PhD 1949 Ohio State U.

HARMON, M. JUDD (1951) Asso. Prof. of Political Science BS 1948 USU, MS 1950, PhD 1953 U of Wis.

HARRIS, 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.

HASLEM, DEAN W. (1950) Manager, USU Bookstore. BS 1949 BYU, MS 1957 USU.

HASSELL, ROBERT L. (1947) Asso. Prof., Extension Services; Carbon Co. Agent. BS 1942 BYU, MS 1957 Cornell U.

HATCH, HAROLD CARL (1961) Instr., Extension Services; Kane Co. Agent. BS 1960 USU.


HAWES, B. AUSTIN (1957) Asso. Prof. of Entomology. BS 1948, MS 1949 USU, PhD 1956, Iowa State C.

HAWES, FRANK W. (1953) Res. Asst., Civil and Irrigation Engineering. BS 1946 USU.
HELM, WILLIAM T. (1959) Asst. Prof. of Wildlife Resources. BS 1960, MS 1961, PhD 1958 U of Wis.

HENDERSON, GEORGE R. (1944) Prof. of Animal Husbandry; Animal Husbandry Specialist, Extension Services. BS 1929, MS 1930 USU.

HENDRICKS, KING (1938) Prof. and Head, Dept. of English and Journalism. MA 1926, PhD 1941 Stanford U.

HEYBORNE, ROBERT L. (1957) Asst. Prof. of Electrical Engineering. BS 1949, MS 1960 USU. Graduate Naval Electronics School.

HIGBEE, ARTHUR (1957) Asst. Specialist and Asst. Prof., Extension Services. BS 1948 USU.

HILL, LEON M. (1957) Instr. in Industrial, Technical Education. BS 1952 USU.

HIMES, ELLVERT H. (1954) Coordinator 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.

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